UNIV. OF
TORONTO
LIBRARY

SHOUT
SHARE
IT

L38 — 73

BULLETIN

OF THE

BUFFALO SOCIETY OF NATURAL SCIENCES.

VOLUME III.

FROM APRIL, 1875, TO AUGUST, 1877.

46330
99.

BUFFALO:
PUBLISHED BY THE SOCIETY.

1877.

PRESS OF
THE COURIER COMPANY,
BUFFALO, N. Y.

12948

BUFFALO SOCIETY OF NATURAL SCIENCES
VERE SCIRE EST PER CAUSAS SCIRE
ORG'D. DEC. 5 1861.

COMMITTEE ON PUBLICATION.

GEORGE W. CLINTON, LL. D.
CHARLES D. MARSHALL.
GEORGE P. PUTNAM.
HENRY CHANDLER.
GEORGE E. HAYES, D. D. S.
LEON F. HARVEY, M. D.

AUG. R. GROTE, A. M., Chairman.

CONTENTS.

I. Description of a New Crustacean from the Water Lime Group at Buffalo. By Aug. R. Grote and W. H. Pitt, ... 1

II. On Texan Lepidoptera collected by Mr. Belfrage. By Leon F. Harvey, a. m., m. d., ... 3

III. On New Species of Eusarcus and Pterygotus from the Water Lime Group at Buffalo. By Aug. R. Grote and W. H. Pitt, 17

IV. Synopsis of the Discomycetous Fungi of the United States (Part II). By M. Cooke, m. a. 21

V. A List of the North American Syrphidae. By Ch. R. Osten Sacken, . . , ... 38

VI. An Illustration of North American Agrotis and Oncocnemis. By Leon F. Harvey, m. d. 72

VII. On Noctuidae from the Pacific Coast of North America. By Aug. R. Grote, ... 77

VIII. Concerning the Fishes of the Ichthyologia Ohiensis. By David S. Jordan, m. s., m. d. 91

IX. Synonymic List of the Butterflies of North America, north of Mexico. By Samuel H. Scudder, ... 98

X. Check List of the Fishes of the Fresh Waters of North America. By David S. Jordan, m. s., m. d., and Herbert E. Copeland, m. s. 133

XI. The Shinumos—A Pre-Historic People of the Rocky Mountain Region. By F. S. Dellenbaugh, ... 168

XII. On the Peopling of America. By Aug. R. Grote, ... 181

XIII. On certain Species of Black-winged Catocala. By Aug. R. Grote, 187

XIV. Hyphomecetous Fungi of the United States. By M. C. Cooke, m. a. 189

XV. Recent Archaeological Discoveries in the American Bottom. By Henry R. Howland, ... 204

XVI. Description of a New Species of Argulus. By D. S. Kellicott, . 214

XVII. New Check List of North American Sphingidae. By Aug. R. Grote, ... 220

BULLETIN

OF THE

BUFFALO SOCIETY OF NATURAL SCIENCES.

BULLETIN

OF THE

BUFFALO SOCIETY OF NATURAL SCIENCES.

VOLUME III.

I. Description of a New Crustacean from the Water Lime Group at Buffalo

BY AUG. R. GROTE AND W. H. PITT.

[*Read before this Society, July* 2, 1875.]

THE impression of the ventral surface of a Crustacean is exposed in the specimen of a new form allied to *Eurypterus* and *Pterygotus*, for which the name EUSARCUS SCORPIONIS is proposed. The cephalothoracic portion appears to be separate from the body, and to be considerably narrower in proportion than in allied forms. The legs are in the same number as in *Eurypterus*. The swimming feet appear to differ by the straighter, less rounded outer margins. In the specimen the rhomboidal plates are not given. From the impressions of the joints of the swimming feet their relative dimension does not seem to accord with *Eurypterus*. The four pair of anterior feet proceed from two elongate oral plates of which the impression is very distinct. The spines of the anterior feet appear to be long, curved, and to have an anterior direction. The absence of chelate appendages to the posterior margin of the feet is particularly noticeable. The first seven broad segments of the abdomen form a large ellipse. There is an evident and remarkable narrowing of the succeeding caudal segments. Of these

six appear to be made out on the specimen. The surface of the cast is punctate with scattered triangular impressions. The cast shows a widening of the terminal segment and no traces of a spiniform process are exhibited. This portion of the fossil was imbedded in the matrix, and seems to have been bent downwards and outwards in the specimen. The greater flexibility of the caudal segments may be inferred from their shape and position. The specimen from which the above description is drawn was found in the water lime group at Buffalo, N. Y., in the same bed which has furnished us specimens of *Eurypterus lacustris.* The length of the entire specimen is two hundred and fifty millimetres; the greatest width of the body is one hundred and ten millemetres.

The interest which attaches to this remarkable Crustacean arises from the discovery of a form which may be allowed to be higher than *Eurypterus* and *Pterygotus* from the peculiar differentiation of the body expressed by the narrowness of its cephalothoracic portion, and the sudden constriction of the terminal segments.

The accompanying photographic plate (I) illustrating the specimen, has been prepared by Mr. Alfred W. Simon of Buffalo. The collection of the Buffalo Society of Natural Sciences owes the specimen to the liberality of Mr. U. Cummings.

II. On Texan Lepidoptera collected by Mr. Belfrage

BY LEON F. HARVEY, A. M., M. D.

[*Read before this Society, July* 9, 1875.]

THE material upon which the present paper is based was received from Mr. G. W. Belfrage, Clifton, Bosque Co., Texas. It consists chiefly of Noctuidae.

A few years ago collections made by this gentleman, in the same State, were examined by Messrs. A. R. Grote and C. T. Robinson, who at that time published a number of species.[1] I have published in the second volume of the Bulletin several species from the same locality, reference to which is made in this paper. There has also appeared in the proceedings of the Boston Society of Natural History, 17, 209, a paper by Mr. H. K. Morrison, in which a list of species is given as collected at Waco (McClellan Co.), but which apparently are to be credited to Clifton (Bosque Co.).

Of fifty-five species there enumerated, the following five remain unknown to me: *Bryophila percara*, *Agrotis Morrisoniana*,[2] *Hadena relicina*, *Segetia orbica*, *Tarache tenuicula*.

I rarely cite any of the remaining fifty species of Mr. Morrison's, all known to me, except in cases when I adopt a different name or add a date of capture.

With Mr. Morrison's paper and the observations of the present article, an approximate idea may be formed of the character of the lepidopterous fauna of the locality, so far as the night-flying moths are concerned.

In the preparation of this paper I have to acknowledge the disinterested assistance I have received from Mr. Grote.[3]

---

[1] Trans. Am. Ent. Soc. 1-5.

[2] I can find no description of this species.

[3] Treitschke having used the generic name Lita in the Tineidae, I now propose to replace it by Litocala, for the Californian Lita sexsignata *Harv.*

Lithosia cephalica *Grote and Robinson.* April 30; June 2, 3.

Cisthene unifascia *Grote and Robinson.* October 12.

Cisthene tenuifascia n. s.

Possibly, with *unifascia*, a form of *subjecta*, larger than *unifascia*, with a narrow, sometimes interrupted, median transverse deep yellow band, the yellow color extended to the base along internal margin. Else as in *unifascia*, of which this may be the spring brood. The rosy secondaries distinctly plashed with lead color at apices. May 3, No. 85 (in part).

Eustixis subfervens (*Walker*). *Enaemia psammitis* Zeller. March 12, 18, 28.

Nola minuscula *Zeller.* March 3, 5, 8, 11. No. 228.

As the animal has no ocelli it may be correctly referred to the Lithosians. The male antennae are pectinate, female simple. The specimens sent by Belfrage do not vary much, and seem to have been all taken in the spring.

Ameria unicolor (*Robinson*). May 5. No. 478.

Arctia Saundersii *Grote.* *Arctia intermedia* Stretch. October 4, 6, 7, 10.

Eutolype Rolandi *Grote*, Proc. Acad. N. S. Phil. 1874, 198. *Copipanolis vernalis* Morrison. March 3, 13. Three specimens. The stigmata are variably distinct.

Charadra dispulsa *Morrison*, Proc. Bost. S. N. H., 1874, 213. Both sexes collected by Mr. Belfrage March 25.

Differs from *deridens* by the want of a submedian dash, the erect position of the t. p. line and the more vague subterminal. In tone the two are similar and the Texan form cannot be considered to be at all closely related to *propinquilinea* as asserted by Mr. Morrison. The ordinary spots are yellowish in the specimens, and show a very few central black scales. The fringes are indistinctly chequered outwardly. A good character seems to be offered by the line on the hind wings, beneath, which is nearer the outer margin in *dispulsa*.

The points in which my specimens differ from Mr. Morrison's remarks on the species, are not sufficient to cause me to doubt in any way my determination. (No. 482.)

Diphthera fallax H. S. March 23 to 28; April 29; July 20.

Apatela lobeliae (*Guenée*). March 25 to 28; April 25.

Apatela afflicta *Grote.* March 13 and 23.

Apatela persuasa *Harvey.* March 11 to 23.

Apatela clarescens (*Guenée*). March 23 and 24; April 23; July 17 and 28.

The disc of the thorax shows a slight yellow tuft anteriorly, which may serve to identify the species.

Apatela ovata *Grote.* July 20.

Apatela paupercula *Grote.* March 13 to 28. Ten specimens vary a little in size; the primaries, in the freshest examples, are tinted with olivaceous, so that a resemblance to *A. vinnula* is thereby presented.

Apatela xyliniformis (*Guenée*). July 26 to 29; Aug. 6.

Agrotis simplicia [us] *Morrison.* March 8; April 24. All three stigmata are occasionally indicated.

Agrotis lubricans (*Guenée*). March 25; July 20.

Agrotis incivis *Guenée.* Dec. 2, 3.

Agrotis chortalis *Harvey.* Nov. 5, 6. There is a distinct mesial thoracic ridge. The species is easily recognized by its Glaea-like aspect, faded olive color, the basal and t. a. lines velvety black, contrasting, the latter obsolete inferiorly.

Agrotis sculptilis *Harvey.* Nov. 8.

Agrotis rudens *Harvey.* Dec. 1, 3. Belfrage's Numbers are 56, 57.
A single specimen wants the longitudinal black dashes.

Agrotis malefida *Guenée.* Nov. 8; Dec. 21. Easily confounded with *annexa.* A specimen from Alabama, collected by Mr. Grote, is in the collection of this Society.

Belfrage's Numbers are 44, 45.

Agrotis annexa *Treits.* Dec. 2, 3. Belfrage's Numbers are 51, 52.

Agrotis badinodis *Grote.* Nov. 2.

Agrotis tricosa *Lintner.* Oct. 7 to 14.

There is no approach to *subgothica* in a number of specimens, while the hind wings in the male are in two specimens lighter at base. Since the validity of the species does not rest on the character of the hind wings, I regard Mr. Morrison's opinions, that the Texan specimens of *tricosa* approaches more closely to the true (?) *subgothica*, than northern specimens of that variety, as improbable.

Agrotis inconcinna n. s.

♂.—A species with simple antennae and havingall the tibiae spinose. The color is not unlike *saucia*, but this is a smaller species, with narrower primaries, having the exterior margin rounded, less oblique. In form it is like *auxiliaris*, but the markings are more effaced, the color more brown, the hind wings more glossy. The head and collar are dark brown, the thorax a little paler. The terminal space is blackish, the rest of the wing brown, with the

lines obliterate. The subterminal line is best marked, undulate, without cuneiform marks. Ordinary spots faint, discolored, the reniform moderate, short, stained with blackish, annuli indistinct, median shade linear, slightly irregular, outwardly arcuate, not very evident. T. a. line and claviform obsolete, costal geminate markings as in *auxiliaris*. Hind wings pellucid smoky, with vague blackish borders and white-tipped fringes. Abdomen like hind wings in tone, beneath paler with whitish stigmatal stripe. Wings whitish beneath, slightly and coarsely irrorate with black; on secondaries a discal mark, a faint median line on collar. *Expanse*, 38 m. m. May 12. No. 54.

Nearly allied to *auxiliaris*, narrower winged and smaller.

Agrotis auxiliaris *Grote*. May 16. No. 53. The specimen agrees with the type from Colorado.

Mamestra marinitincta *Harvey*. Oct. 10; Nov. 5.

The male has blackish hind wings. The species is allied to *Mamestra laudabilis* (Guen).

Dianthoecia palilis *Harvey*. Nov. 10, 11, 16. No. 98.

Copihadena atricollaris (*Harvey*). March 12, 27. No. 92.

Homohadena induta *Harvey*. May 3, 5. No. 74.

I have recently shown (Can. Ent. 7) that Mr. Morrison's description of *retroversa* does not apply to this species. The basal dash is present. It is impossible to adopt that name without depriving the description of all value for identification. I believe Mr. Morrison to be greatly in error, although if he were right, the name *retroversa*, must be ruled out as not in any way designating *induta*.

Homohadena incomitata n. s. In tone, color and size resembling *induta*.

There is no basal dash and no marking except the median lines which differ from *induta* in shape. They meet very nearly at internal margin. The outer line runs inwardly obliquely from its subcostal extension without being submedially indented opposite the basal dash, as in *induta*. The subterminal nervular dashes are subobsolete. The black lines are a little more broken and denticulate than in *induta*, in some specimens subobsolete. Hind wings with very faint traces of the median line, which *induta* shows plainly, and is said to be absent in *retroversa* as in *Kappa*. Beneath, the line is fragmentary. From the fact that *induta* has a median line beneath and "*retroversa*" is said to have none and has a basal dash in fore wings, and "*retroversa*" is said to have none, there is a chance that Mr. Morrison intended *incomitata*, which differs from *induta* in both these points. Mr. Morrison says, however, that he described *induta*. In this case I think Mr. Morrison's description may, with propriety, be discarded, from the facts in the case.

May 3, 4. No. 75.

Perigea xanthioides *Guenée.* March 23; April 22. No. 136.

Perigea enixa *Grote.* Aug. 7, 12. No. 137.

Perigea fabrefacta (*Morrison*). Nov. 7; Dec. 12. No. 86.

Oligia chalcedonia (*Hübn.*). July 25; Nov. 5 to 26. No. 80.

This is *O. tracta* Grote. Not having seen Hübner's figure, I am not perfectly clear as to the species he intends, but this agrees very well with Guenée's description, Noct. 1, 221. The species has deep brown fore wings, sometimes pale along costal region, the t. p. line followed by a white shade, the reniform moderate.

Oligia arna *Guenée.* March 25 to April 29. No. 103.

This agrees with Guenée's description, except that the large reniform can hardly be called "oblique." The color is olive gray, tinted more or less obviously with ruddy, and having the reniform usually, but not invariably, picked out by dark brown shades inferiorly. The species occurs likewise in the mid dle states, and is provisionally determined (with an ?) as *chalcedonia* in the collection of the Buffalo Society of Natural Sciences.

Hadena patina n. s.

♂.—Belongs to the section *xylophasia.* A species of moderate size, with a pale, creamy brown, ground tint to the primaries which prevails but slightly, most prominently on subterminal space, the wing being largely shaded and marked with black. No basal dash. A distinct black dash on internal margin, preceding the long final acute tooth of the t. a. line. T. a. line geminate, improm. inent, and not acutely toothed superiorly, nearly even or a little waved to the prominent acute inflection on internal margin. Claviform small and rounded. Orbicular not very evident, rounded, rather large, pale ringed. Reniform squarish, incompletely annulate, the ring marked laterally by black and white points, the white points larger outwardly. Above the reniform, two more prominent black marks, the inner indicating the median shade which appears near the t. p. line below the median vein, as a rivulous line. T. p. line geminate, even, followed by a large black blotch before the subterminal line and interrupting the pale subterminal ground color between veins 1 and 2. Black points follow the t. p. line. Subterminal line vague, followed by minute white points surrounded with black. The pale brown color forms the usual W mark, interrupting the black terminal space. Hind wings shaded with fuscous out. wardly, pale at base; fringes pale. Beneath pale, irrorate, both wings darker outwardly, with a common rivulous exterior line bending inwardly before anal angle of hind wings which show a small discal dot. Collar with a velvety black line; thorax dead black, tegulae brownish. *Expanse,* 32 m. m. No. 485. March 23.

This must be smaller than *relicina*, and differs so entirely from Mr. Morrison's description, that it cannot be supposed the same.

Heliophila Harveyi *Grote.* March 25; April 27.

An interesting variety occurred, in which the costal region is shaded with blackish.

Heliophila adjuta *Grote.* March 3; No. 480.

Both sexes. The female (and not the male) is described by Mr. Grote. The male wants the fuscous shading on the hind wings. The double lines on the collar and the yellow color (like *pallens*) distinguish this larger species. In the male the costa is marked at the inception of the t. p. line.

Heliophila ligata *Grote.* March and November. A large number of specimens collected.

Heliophila phragmitidicola *Guenée.* March, and one specimen May 5.

Heliophila subpunctata n. s.

♀.—Much like *adonea*, but differing by the pellucid secondaries which show but a narrow terminal fuscous shading and the more blackish primaries. T. p. line black dotted, subcontinuous superiorly. White dot on the median vein distinct. In appearance there is, perhaps, an unusual similarity of the fore wings to *unipuncta*. Beneath, the obsolete line is incepted by an unusually strongly marked black spot. Collar and thorax obscure, the former faintly lined. Costal region paler than the rest of the wing, streaked with pale along the veins. A median diffuse blackish shade, spreading from the median vein.

Expanse, 36 m. m. March 23. No. 495.

Caradrina grata (*Hübner*). *Hadena rasilis* Mor. March 24.

Prodenia lineatella *Harvey.* April 27; Oct. 27. No. 77.

Prodenia flavimedia *Harvey.* April 25. No. 78.

Prodenia commelinae (*Abb. & Sm.*) Dec. 2. No. 76.

Jodia rufago *Hübner.* March 5 to 12.

Orthosia distincta *Grote.* Oct. 13.

Orthosia posticata n. s.

♂.—Size and facies of *Pseudorthosia variabilis*. Legs unarmed. Eyes naked with lashes. Abdomen untufted. Fore wings dirty ocherous, powdered with dusty scales. Ornamentation faint; blackish spots on costa indicate the inception of the waved single blackish median line. Subterminal line running near

the outer margin resolved medially into black triangulate marks preceding pale tints. Apices pale marked. Orbicular obsolete; reniform dark, narrow, ringed with pale points. Hind wings wholly testaceous white, immaculate, unlined beneath, with a minute discal point, a terminal broken line before the whitish fringes, and the costal portion yellowish. Fore wings pale, with exterior faint shaded lines. Palpi dusky except terminal article. Thorax like fore wings. A lateral dusky line from the head to base of fore wing. Abdomen pale dusty ocherous.

Expanse, 35 m. m. Nov. 2. No. 150.

Glaea tremula *Harvey*. Nov. 2.

Orthodes infirma *Guenée*. March 27.

The single specimen has the thorax and fore wings of a reddish brown, not olive brown color.

Acopa carina *Harvey*. Oct. 7, 9.

Cleophana occata *Grote*. April 29; May 13. Nos. 96 and 487.

Pteraetholix bullula *Grote*. Dec. 3.

Phyprosopus callitrichoides *Grote*. *Doryodes acutalis* Walk. (nec Guen.). May 6. No. 215.

Marasmalus histrio *Grote*. July 2. No. 227.

Ingura praepilata *Grote*. April 29; May 5. No. 226.

Pippona n. g.

A genus which is allied to the Heliothid genera by the armature of the tibiae and the embossed clypeus. The silky white color recalls *Grotella* and *Euleucyptera*, and the insect may be placed before these genera. The eyes are naked, the vestiture is scaly. Thorax and abdomen untufted. The ocelli are present. The palpi are slender and short, closely scaled. The maxillae are moderate. Antennae simple in the male, feebly setose beneath, discolorous, with dark brown scales above. The cut of the wings is somewhat as in *Heliophila*, to which there is an apparent resemblance. But the moth on the whole simulates more strongly the Arctiid genus *Euchaetes*, so that at first sight one might take it for one of the white species of that Bombycid genus. The fore tibiae are armed with three inner and two outer terminal, and longer claws, before the first of which latter there is also a short spine. The middle and hind tibiae are sparsely spinose.

Pippona bimatris n. s.

♂.—Fore wings entirely satiny white, immaculate, very faintly yellowish over costal region. Head and abdomen yellowish. Thorax white. Hind wings white, slightly dusted with fuscous. Beneath the fore wings are mostly fuscous, yellowish along the margins. Hind wings white. Antennae dark brown above.

Expanse, 30 m. m. Oct. 4. No. 473.

Grotella septempunctata *Harvey*. Oct. 3.

Tricopis aleucis *Harvey*. Oct. 3, 7. No. 117.

Tricopis chrysellus *Grote*. Oct. 11. No. 116.

Lygranthoecia roseitincta *Harvey*. One specimen. No. 232.

Tamila tertia *Grote*. May 11; Sept. 1, 9.

Wrongly referred by Mr. Morrison to *Heliothis*. The thoracic vestiture is scaly. The spring specimens are more distinctly marked and yellowish in tone.

Heliothis cupes *Grote*. May 5.

Tarache cretata *Grote and Robinson*. May 2. No. 114.

Tarache lactipennis *Harvey*.

Allied to *cretata*, but very much larger. Head, thorax and a narrow oblique basal patch deep brown. A metallic tuft on the thorax behind. Fore wings milk white. A subterminal, broad, deep olive shade from apices to internal margin, containing a narrow dentate lilac white line. A greenish costal spot at about apical third. Terminal space whitish, with a terminal dark shade line. Hind wings and abdomen white, the former with a very slight fuscous edging. Beneath primaries wholly dark, except along internal margin; hind wings wholly white.

Expanse, 28 m. m. May 3. No. 111.

Tarache angustipennis *Grote*. June 5. No. 493.

Telesilla cinereola (*Guenée*). April 30.

Telesilla navia n. s.

Three specimens differ from *cinereola* by the constriction of the median space at internal margin, owing to the inward inclination of the t. p. line below the median vein. The orbicular is obsolete. The reniform more closely outlined, constricted, incomplete. The ground color is carneous as in some specimens of *cinereola*, this tint obtaining basally and largely subterminally, owing

to the greater width of the s. t. space. Median space colored like its ally, and the species generally has a great resemblance to it; the divergence in shape of the t. p. line alone making me believe we have to do with more than a variety. Hind wings a little paler, more testaceous than in *cinereola* than which it is narrower winged. May 2. No. 194 (in part).

Prothymia coccineifascia (*Grote*). July 30. No. 367.

Prothymia orgiae *Grote*. July 1.

Prothymia subolivacea n. s.

Differs from the preceding by the more elongate and apically produced primaries. Fore wings olivaceous, shady with rosy at base, obliquely over internal margin, and again terminally. Thorax shaded with rosy. A single dusky, even, oblique, outer transverse line, on fore wings. Minute superposed points take the place of the reniform as in *orgiae*. Head and palpi and collar, discolorous leaden-hued. Hind wings obscure, rosy olive, paler at base. Beneath testaceous powdered with rosy; fore wings clouded with fuscous over the middle.

Expanse, 23 m. m. March 29. Number 498.

Metoponia obtusa *H.–S.* April 20.

Three specimens are certainly identical with *obtusula* Zeller, which Mr. Grote regards as synonymous. They in fact seem merely to differ from H.–S.'s figure and a Pennsylvania example exactly agreeing, in the smaller size and reduced markings of the fore wings.

Metoponia perflava n. s.

A single specimen differs from *obtusa* (and *obtusula*) in the clear lemon yellow primaries with the apices more produced. The spots on costal and internal margin are well sized and similarly placed and colored.

The other markings are very much reduced and fragmentary but evidently occupy analogous positions. But the under surface is very different in the two forms. It is tinted with lemon yellow in *perflava*, the primaries not shaded with fuscous as in *obtusa*. There is a broad subterminal band apparent over the upper half of both wings. Within this is a transverse line, distinct over the costal regions and approximate to the band. A median fuscous shade is also more or less noticeable on both wings. The coloration of the head and thorax lemon yellow.

Abdomen pale like the hind wings above, which show some terminal yellow tintings and faint lines.

Expanse, 26 m. m. April 4. No. 496.

Galgula subpartita *Guenée.* March 3, 23, 28.

Galgula hepara *Guenée.* March 3; May 23 (Second brood very probably).

Remigia hexastyla *Harvey.* March 3, 13, 28.

Remigia latipes *Guenée* (*texana* Morrison?). Oct. 28; Nov. 2.

Mr. Morrison's description is not intelligible.

Remigia indentata *Harvey.* Oct. 27.

This may only be a variety of the foregoing *latipes*, since I notice in some specimens of the latter an approximation of the infra—reniform spot to the t. p. line. In *indentata* this spot is open to the line which is discontinued across the mouth. Somewhat the same character is afforded by certain species of *Catocala*.

Catocala agrippina *Streckcr.* July 9, 18.

Catocala Verrilliana *Grote.*

This species has been fully described by Mr. Grote. It is the smallest known species with red secondaries. The fore wings resemble *Catocala polygama;* the subreniform is pale, isolated. The median black band of the hind wings is narrow, terminating before the internal margin. Beneath both wings stained with red; secondaries with the band notched superiorly, rounded on the disc, discontinued. It is easily recognized by the above characters. No. 499. June 13. The moth expands 48 millimetres.

Catocala piatrix *Grote.* July 17, 21. No. 5.

Catocala Clintonii *Grote.* May 10. No. 500.

Catocala Belfragiana *Harvey.* May 16. No. 9.

Bolina ochreipennis *Harvey.* April 29 and again Nov. 5.

A number of specimens agreeing perfectly and differing from *nigrescens* by the oblique median ocherous fascia of the fore wings. Mr. Morrison's "*fasciolaris*" may apply to this or the next species.

Bolina nigrescens *Grote and Robinson.* Nov. 8.

Mr. Morrison refers this as identical with *fasciolaris* Hübner 443, 444. Hübner's species however has narrower, more elongate fore wings, a median ocherous fascia, like *ochreipennis*, and a large ovate vague yellowish subterminal blotch, inside of which a line from the apices sinuously runs, by which it strongly differs. Mr. Grote informs me that he has identified a specimen of Hübner's species agreeing with his figure and differing decidedly from either of the foregoing, in the collection of the American Entomological Society.

Bolina pallescens *Grote and Robinson.*

A specimen of this beautiful species was taken by Mr. Belfrage on the 25th of March and numbered 484.

Bolina agrotipennis *Harvey.* Nov. 5.

Bolina jucunda (*Hübner*). *Bolina cinis* Guen. July 9; Sept. 1.

Eubolina impartialis *Harvey.* July 29.

Cirrhobolina deducta (*Morrison*). April 29, ♀ No. 19. May 10, ♂ No. 18.

Cirrhobolina incandescens *Grote.* Dec. 1. No. 17.

Stictoptera divaricata *Grote.* Dec. 3.

Panopoda rufimargo, *Var.* roseicosta *Guen.* April 28. No. 32.

Pleonectyptera immaculalis n. s.

♂ ♀.—Allied to *phaluenalis* and differing by the want of the reniform. Pale fawn color above, vermillion tinted beneath. The inner line faint on the primaries, the outer more distinct, pale red, with accompanying pale shade. Dots take the place of the subterminal. One specimen shows minute superposed points replacing the reniform. Another has a more olivaceous tinting. Outside of the t. p. line the wing shows a faint darker hue, and there is everywhere a slight powdering with fuscous.

Expanse, 20 m. m. July 3, 10. No. 208.

Trama arrosa n. g. et sp.

♂ ♀.—The form is like *Agnomonia*, the third palpal joint is a little longer, the vestiture thicker, the legs a little shorter. The fore wings are sub-falcate and the lines of the ornamentation are continuous on both wings. Purple brown, more distinctly marked in the male. Lines darker than the wing; the t. a. linear with a single inward inflection on the cell. Reniform indistinct, all that is visible is a whitish inferior spot. Orbicular a dark dot at the inward inflection of the t. a. line. Median shade blackish. T. p. line with a sharp sub-costal angulation. Subterminal line preceded by a broad diffuse blackish shading proceeding from the apex, very prominent in the male. Both the t. p. and s. t. lines continuous on the concolorous hind wings. Beneath paler with a common line inflected sub-costally on primaries.

Expanse, 30 m. m. June 15. Nos. 191 and 192.

Homoptera edusina n. s.

Resembles *edusa* in having the terminal space blotched with whitish. A small, brownish black species, with the t. p. line velvety black, narrow, the subterminal line more prominent, velvety black, irregularly sinuate, exserted at the middle. The median space is somewhat grayish. Reniform spot indistinct, stained with whitish. Median space traversed by perpendicular shade lines. Hind wings like primaries, with improminent whitish shading succeeding the black central lines.

Expanse, 33 m. m. March 18. No. 180.

Homoptera atritincta n. s.

Size of *edusina*, without the blotches and of an olivaceous blackish. Median and subterminal lines velvety black. Reniform touched with white. Differs by its color which approaches that of *Matigramma pulverilinea* (a form that differs by the absence of thoracic tufts) while darker, more blackish. The markings are substantially as in *edusina* and other species. Many specimens were collected in March. The species is numbered 181, by Mr. Belfrage. The smallest specimen expands 30, the largest, 35 m. m.

Specimens of *H. edusa*, *lunata* and *Saundersii*, have been formerly received from Mr. Belfrage.

The following well marked species has been received from Mr. J. Pettit, collected in Canada:

Homoptera benesignata n. s.

The fore wings are blackish at base within the t. a. line which runs inwardly obliquely from vein 1 to internal margin. Succeeding the t. a. line is a broad ashen band covering the median space before the perpendicular sinuate median shade, and widening on internal margin, conforming to the inflection of the t. a. line. Behind the median shade the median space is shaded with brown, notably so from vein 2 to internal margin. Reniform a narrow blackish lunule, its outer edge lined with white. T. p. line black, dentate opposite the cell, of the usual shape, followed by the narrow, black, uneven subterminal space widening to costa. Terminally the wing is shaded with ashen. Hind wings pale fuscous, shaded with ashen outwardly. A very distinct narrow median brown band, margined by two black lines, the outer of which is edged with white. Beneath pale fuscous brown, concolorous; a common dentate line. Collar brown; thorax blackish brown with ashen shades.

Expanse, 40 m. m.

Matigramma pulverilinea *Grote.* March 28; Sept. 15, 16.

Zale horrida *Hübner.* March 23; Aug. 7.

Spargaloma umbrifascia *Grote.* May 5. No. 497.

Pseudaglossa lubricalis (*Geyer*). May 15; July 10; Oct. 14.

Epizeuxis aemula *Hübner*. *Microphysa? mollifera* Walk. March 30; July 2, 20. No. 252.

Epizeuxis americalis (*Guenée*). *Microphysa? scriptipennis* Walk. July 20; Nov. 6. No. 251.

Bleptina caradrinalis *Guenée*. April 27; May 5.

Bleptina inferior *Grote*. May 15; Aug. 3; Oct. 3.

Tetanolita lixalis *Grote*. March 23, 26.

Pseudorgyia versuta *Harvey*. May 15.

Plathypena scabra (*Fabr.*). May 6, 9.

Endropia vinosaria *Grote and Robinson*. April 30; June 3, 4, 5. No. 255.

Fidonia fimetaria *Grote and Robinson*. *Fid. halesaria* Zeller. July 5; Sept. 16. No. 321.

Tornos robiginosus *Morrison*. March 5; May 4; Dec. 2, ♂ ♂ No. 296; March 26; May 5; July 3, 7, 20, ♀ ♀ No. 297.

This genus and species is allied to *Cymatophora* (*Boarmia*). The wings are narrower and more elongate. Male antennae pectinate, female simple. Leaden gray, usually darker in males, and along the borders of the wings.

A common exterior black line, more or less distinct, and followed by the ocherous, outwardly brown bordered subterminal space. A black discal raised scale spot; sometimes the median shade, traversing it, is visible. Inner line indistinct.

Females more or less wholly light ocherous, mottled.

Expanse, 22, 24 m. m.

Mr. Morrison's error in describing the moth as a Noctuid is very apparent.

Anisopteryx vernata *Peck*. Jan. 25; March 3. Number 299 (♂ ♂).

Cymatophora psiligrammaria *Packard*. March 3; May 16; Aug. 3. No. 300.

Cymatophora larvaria (*Guen.*). May 3. No. 292.

Acidalia inductata *Packard*. Oct. 3 to 7. No. 313.

Ochyria latirupta (*Walk.*). May 4. No. 340.

This is considered by Dr. Packard as a form of *O. designata* Hufn., which latter is also sent under the number 334 and as taken March 23.

Nemoria chloroleucaria *Guen*. April 4. No. 326.

Asopia farinalis (*L.*). Oct. 16. No. 416.

Asopia olinalis *Guenée.* Aug. 6; Oct. 5, 12. Nos. 356 and 357.

The color varies to olivaceous, one specimen (♂) being almost entirely greenish in hue.

Eustixia pupula *Hübner.* Zutr. 327–8. April 30; May 2. No. 408.

Botis fracturalis *Zeller.* March 10; May 5, 27. Nos. 384, 385.

Three specimens differing among themselves in the shape and extent of the silver markings and also in the ground color which is pale ocher brown in one specimen. Whether *ventralis, argyralis* and *fracturalis* are distinct species or all forms of a single one is undecided but possible.

Botis vinulenta *G. & R. Rhodaria signatalis* Walk. April 5; May 6. No. 359.

Botis laticlavia *G. & R.* May 4. No. 360.

Botis cinerosa *Grote and Robinson.* Oct. 12, 15. No. 361.

As suspected by Prof. Zeller this is probably an autumnal form of *laticlavia.*

Botis diffissa *Grote and Robinson.* March 29; May 16. No. 366.

This is perhaps the same as *tyralis* Guen. The specimens vary in depth of color and distinctness of markings.

Argyria argentata (*Drury*). *Urola chamaechrysella* Walk. July 6; Oct. 14. No. 411.

Eromene texana *Robinson.* Two specimens. No. 450.

Scirpophaga vestaliella *Zeller.* April 30. No. 410.

Explanation of Plate II.

1. Apatela persuasa.
2. Apatela paupercula.
3. Tarache lactipennis.
4. Hadena patina.
5. Tricopis aleucis.
6. Cleophana occata.
7. Agrotis rudens.
8. Homohadena induta.
9. Homohadena incomitata.
10. Bolina ochreipennis.

III. On New Species of Eusarcus and Pterygotus from the Water Lime Group at Buffalo

BY AUG. R. GROTE AND W. H. PITT.

[*Read before this Society, September* 3, 1875.]

THE dorsal surface of a species belonging to the genus *Eusarcus* Grote and Pitt, is exposed in a specimen from the same beds from which the type of the genus, *E. scorpionis*, was procured. The new species, for which the name *Eusarcus grandis* is proposed, is apparently one of the largest fossil Crustaceans known from our Water Lime Group. Four segments of the abdomen are distinctly shown in the specimen. As compared with the specimen of *E. scorpionis*, these are the fourth, fifth, sixth and seventh segments of the animal; the last named segment being the one preceding the narrow caudal segments in this genus. This is determined by the shape of the seventh segment. A trace of the first caudal segment is seen, medially, in the specimen. The fourth and fifth segments overlap a little on the right side. The sixth is partially displaced and imbedded in the matrix. The seventh is in position and completely shown. The surface is roughened with scattered, irregular, somewhat rounded-heart-shaped tubercles, which are more thickly massed along the middle of the segments; these latter are smooth, perhaps worn along the margins. The fourth and fifth show a mesial line along which the tubercles are gathered. The fourth segment has become, in the specimen, narrowly separated along this line in front. The length of these segments in the specimen is $6\frac{1}{4}$ inches; in *E. scorpionis* the same segments measure $2\frac{3}{8}$ inches. From these data the total length of the animal would be about

25½ inches, as compared with the known parts of *E. scorpionis*, which measure 9¼ inches. Specific characters are hardly exhibited by the specimen and it remains uncertain whether a species of *Eusarcus*, larger than *E. scorpionis*, is to be received as distinct.

A specimen showing the basal joint of one of the swimming feet (maxilliped or ectognath) of a species of *Pterygotus* from the same beds is before us, and of which the annexed outline figure has been drawn by Mr. Henry Chandler.

For the species the name of *Pterygotus Cummingsi* is proposed, in honor of the donor. In the specimen the toothed mandibular margin is well shown with a portion of the adjoining lateral margins on each side, while the outline of the remaining

portion of the joint is less clearly shown by an elevated, discolored portion of the rock, showing here and there a trace of the test. In form and size it very nearly agrees with the same part of *P. anglicus* Ag., from the Devonian of Forfarshire, figured by Woodward (Mon. of British Fossil Merostomata, Pl. 4). So far as can be seen it differs from that figure less than do some of the other specimens of that species, figured in the same monograph, and if it occurred in the same bed, little doubt could be entertained of its identity. This part, however, does not appear to afford good specific characters since the figures of different specimens show considerable variation. The specimen of *P. Cummingsi* before us appears to have belonged to as large an individual as any known of *P. anglicus*, which Woodward estimates to have attained a length of about six feet, and a breadth of about two feet. Although apparently agreeing so closely with *P. anglicus*, its identity cannot be sustained, from the fact that *P. anglicus* is found in a higher horizon.

Three species of this genus have been described from the American Water Lime Group, from fragments of different parts of the body. As no two of these are founded on the same part, no comparison, except that of size, is possible. *P. macrocephalus* Hall, and *P. Osborni* Hall, are evidently very much smaller species, measuring scarcely as many inches as *P. Cummingsi* does feet, and are undoubtedly distinct. The third, *P. Cobbi* Hall, is based on "the free ramus of a chelate appendage." Judging from the proportions of the corresponding parts of *P. anglicus* to the entire size, Prof. Hall's specimen belonged to an individual from 1½ feet to 2 feet shorter than *P. Cummingsi*. More complete specimens are needed to establish the relations of these two forms, but for the present it seems advisable to regard them as distinct.

The maxilliped of *Pterygotus Cummingsi* has a breadth of three and a half inches.

It appears that this is the first notice of the maxilliped of *Pterygotus* from the American beds. The present discovery of the maxilliped of *Pterygotus* in the Silurian, is an essential confirmation of the existence of the genus in North America.

It is possible that the articulation of the abdomen, doubtfully referred by Professor Hall to *Pterygotus Cobbi*, and figured by him on plate 83 b., of the Palaeontology of the State of New York, belongs to *Eusarcus*, a genus which must be conceded to be more nearly allied to *Eurypterus* than to *Pterygotus*. It is also possible that the chelae figured as belonging to *Eurypterus pachycheirus*, belong likewise to *Eusarcus*.

IV. Synopsis of the Discomycetous Fungi of the United States

(PART II)

BY M. C. COOKE, M. A.

[*Read before this Society, September* 3, 1875.]

SINCE the publication of the first part of this "Synopsis," and even while it was passing through the press, I became aware of some additions and corrections consequent on the examination of specimens kindly placed at my disposal for that purpose by Mr. C. H. Peck. These corrections will claim attention previous to the continuation of the enumeration.

Helvella gracilis *Peck*, is evidently the same as that referred to *Helvella sulcata* as the variety *pallescens* of Schoeffer. It is clearly more nearly allied to *H. ephippium* and is apparently the same as has been published in Europe as *H. leucophaea*. For the present it is better that Mr. Peck's name should not be disturbed, as I cannot determine for certainty my suspicions, without authentic specimens of the European form.

Geoglossum hirsutum var. **Americanum** (Mycographia, pl. i, fig 1) is a very distinct form with 9-septate sporidia, received from Mr. W. R. Gerard, of Poughkeepsie, N. Y.

Geoglossum flavum *Peck*, was inadvertently written for **Geoglossum luteum** *Peck*, under which latter name it is recorded in Hedwigia, Jan. 1875, and figured in Mycographia, pl. iii, fig. 12.

17. *Peziza phlebophora *B. & Br.* On the ground. Ala. (Peters).

20. Pezizia atrovinosa *Cooke*. The locality should have been New York (Gerard), *not* New Jersey, as stated.

30. P. eupularis *Fr.* Add N. Y. (Gerard).

37.* **P. velutina** *B. & C.* According to specimen from Mr. Peck, determined by the late Dr. Curtis, this is the same as *P. fusicarpa* Gerard.

43.* **P. echinosperma** *Peck.* (Mycographia, pl. vi, fig. 22.) On the ground. N. Y. (Peck).

45.* **P. subhirsuta** *Sch.* On the ground. Rh. Island (Olney).

49. **P. araneosa** *Bull.* (*P. rubra* Peck.) Add N. Y. (Peck).

60. **P. occidentalis** *S.* Add N. Y. (Gerard, sub. *P. coccinea*).

88. **P. balsamicola** (*Nodularia balsamicola* Peck). See Grevillea. From authentic specimen this is *Aleurodiscus amorphus* Rabh.

99.*a* **P. melaxantha** *Fr.* On dead branches. Car. (Rav.).

99.*b* **P. vulpina** *Cooke.* Hedwigia, 1875, p. 82. On rotten wood. N. J. (Ellis).

99.*c* **P. Tiliae** *Peck.* On basswood branches. N. Y. (Peck).

100.* **P. carneorubra** *Ellis.* On stems of *Erigeron.* Sessile, rosy flesh-color; 1 m. m. broad; sporidia linear binucleate. N. J. (Ellis).

108. Mr. Peck doubts the accuracy of our reference of his *Pez. Solenia* to this species. At present we do not see any good ground for retracting our opinion.

113.* **P. nigrocincta** *B. & C.* On sheaths of grass. Car. (Rav.).

116. **P. marginata** *Cooke,* is very shortly stipitate.

116.* **P. fuscidula** *Cooke.* On leaves of *Andromeda,* differs in larger size, longer stem, different hairs, pointed paraphyses and pallid disc. N. J. (Ellis).

144. **P. cannea.** This should stand as *Peziza Arundinariae* B. & C., another name having been given to No. 236 which was also distributed under the name of *P. Arundinariae* B. & C.

159.*a* **P. tela** *B. & C.* On dead wood. Car. (Rav.).

159.*b* **P. atrofusca** *B. & C.* On dead wood. Ala. (Peters).

159.*c* **P. scariosa** *B. & C.* On dead branches. (Berk.).

177. **P. cedrina.** *Cooke and Gerard.*

177.*a* **P. Curtisii** (*P. umbilicata B. & C.*) On decorticated rose. Penn. (Mich.) The name given by B. & C. is preoccupied.

177.*b* **P. extricate** *B. & C.* On Umbellifers. Ala. (Peters).

177.*c* **P. subgibbosa** *Ellis.* On *Andropogon.* Allied to *P. vexata.* Sporidia larger, triseptate. N. J. (Ellis).

181. Subsequent examination has proved this to be a good *Helotium,* imperfectly characterized, and consequently stands as *Helotium macrosporum* Peck.

187.* P. soleniiformis *B. & C.* On dead wood. Ala. (Peters).

187. P. exarata** *B. & C.* On dead wood. Car. (Rav.).

199.*a* P. subcinerea *C. & P.* On rotten wood. N. Y. (Peck).

199.*b* P. cariosa *Peck.* On carious wood. N. Y. (Peck).

199. P. cinerea *Batsch.* Add N. Y. (Peck).

207.* P. aureofulva *Cooke.* On maple wood. N. J. (Ellis).

222.* P. atrata *P.* On herbaceous stems. Car. (Rav.); Ala. (Peters).

222. P. ebuli** *Desm.* On stems. N. Y. (Peck).

222.*$_*$* P. subatra *C. & P.* On herbaceous stems. N. Y. (Peck).

224. Peziza Kalmiae *Peck.* From the description and specimens received from New Jersey, which I believe to be this species, it is clearly a *Dermetea.*

232.* P. luctuosa *Cooke.* On *Polygonum* stems. N. J. (Ellis).

236. P. eustegiaeformis *B. & C.*, instead of *P. arundinariae B. & C.*

247.* P. macrospora *Fckl.* On wood. N. J. (Ellis).

247. P. inquinans** *Cooke.* On wood of apple. N. J. (Ellis).

247.*$_*$* P. radiocincta *Cooke.* On oak wood. N. J. (Ellis).

251.* Pez. flexella *Fr.* On pine wood. Car. (Curt.).

22.* Helotium monticolum *B.* On dead wood. Car. (Curt.).

22 Helotium macrosporum** *Peck.* On beech wood. N. Y. (Peck).

24.* H. aglaeosporum *B.* On dead wood. (Berk).

36.* H. saprophyllum *C. & P.* On rotting leaves. N. Y. (Peck).

Ascobolus major *B. & C.* On dung. Car. (Rav.).

Ascophanus lilacinus *Cooke.* On dung. N. Y. (Gerard).

Bulgaria decolorans *B. & C.* Ala. (Peters).

Order III. PATELLARIACEI.

Gen. 1. DERMATEA *Fr.*

1. D. fascicularis *Fr.* On oak limbs. Beth. (S.); Car. (Curt.; Rav.); N. Eng. (Sprague); N. Y. (Peck).

1. D. furfuracea *Fr.* On hazel branches. Beth. (S.); Car. (S.).

3. D. fissa *Fr.* On branches. Naz. (S.).

4. **D. tabacina** *Cooke.* On living *Quercus alba.* Caespitose, erumpent, stipitate; cups at first subglobose, then cupulate, somewhat coriaceous, margin inflexed, laterally compressed, bay-brown, scarcely furfuraceous; disc paler, hysteriiform when dry; asci clavate; sporidia biseriate, fusiform, granular (.07 × .01–011 m. m.), paraphyses clavate above. N. J. (Ellis 2202).

5. **D. cinnamomea** *Cooke and Peck.* On dead poplar branches. Subcaespitose, erumpent, subsessile, girt by the ruptured epidermis, somewhat coriaceous, externally cinnamon, pulverulent, margin involute; disc brown, discoid, somewhat angular when dry ; asci elongated-clavate, sporidia narrowly elliptical, simple (.0127 m. m.) N. Y. (Peck 304).

6. **D. cerasi** *Fr.* On cherry limbs. Car. (S.); N. Eng. (Sprague); N. Y. (Peck.)

7. **D. carpinea** *Fr.* (Peziza, Sch.). On *Carpinus.* Ohio (Lea); Penn. (Mich.); Car. (Curt.).

8. **D. cydoniae** *Schwz.* On branches of *Cydonia.* Beth. (S.).

9. **D. populnea** *Schwz.* On *Populus Italica.*

10. **D. purpurea** *Ellis.* On *Viburnum.* N. J. (Ellis).

11. **D. spireae** *Schwz.* On *Spirea opulifolia.* Beth. (S.); N. Y. (Peck).

12. **D. Kalmiae** (*Peziza Kalmiae* Peck). On stems of Kalmia. N. Y. (Peck); N. J. (Ellis 2248).

Gen. 2. **URNULA** *Fr.*

1. **U. craterium** *Fr.* On rotton sticks. Car. (S.; Curt.; Rav.); N. Y. (Peck).

Gen. 3. **CENANGIUM** *Fr.*

1. **C. pulveraceum** *Fr.* On branches. Car. (Curt.).

2. **C. ferruginosum** *Fr.* On oak bark. Car. (S. ; Curt.); N. Eng. (Sprague).

3. **C. apertum** *Schwz.* On branches of *Hydrangea.* Beth. (S.); Car. (S.).

4. **C. Juglandis** *B. & C.* On bark of walnut. (Grevillea, vol. iii.) Car. (Curt.).

5. **C. Cephalanthi** *Fr.* On bark of *C. occidentalis.* Car. (S. : Curt.); N. Y. (Peck) ; N. J. (Ellis).

6. **C. Magnolia** *B. & C.* On bark of *M. glauca.* (Grevillea, vol. iii.) Car. (Curt.).

7. **C. Viburni** *Fr.* On bark of *Viburnum.* Penns. (S.); Car. (S.; Curt.).

8. **C. concinnum** *B. & C.* On limbs of sassafras, &c. (Grevillea, vol. iii.) Car. (Curt.).

9. **C. pithyum** *Fr.* On pine chips. Salem (S.); Car. (S.); N. Eng. (Sprague).
10. **C. contortum** *B. & C.* On wood of *Cornus.* (Grevillea, vol. iii.) Car. (Curt.).
11. **C. turgidum** *Fr.* On oak limbs. Car. (S.; Curt.).
12. **C. confusum** *Schwz.* On *Quercus alba.* Car. (S.).
13. **C. triangulare** *Fr.* On oak limbs. N. Y. (Peck); Penns. (S.); Ohio. (Lea); Car. (Curt.); N. Eng. (Sprague).
14. **C. clavatum** *Fr.* On bark of *Prunus serotina.* Car. (S.).
15. **C. ribis** *Fr.* On twigs of *Ribes.* Beth. (S.); N. Y. (Peck).
16. **C. acutum** *Fr.* On *Sambucus.* Beth. (S.).
17. **C. laminare** *Fr.* On *Betula carpinifolia.* Beth. (S.).
18. **C. leptospermum** *B. & C.* On *Pinus strobus.* N. Y. (Curt.).

The following are mostly uncertain and require confirmation:

19. **C. aeruginosum** *S.* On decorticated wood. Beth. (S.).
20. **C. castaneae** *S.* On branches of *Castanea.* Beth. (S.).
21. **C. compressum** *S.* On *Betula carpinifolia.* Beth. (S.).
22. **C. crataegi** *S.* On branches of *Crataegus.* Beth. (S.).
23. **C. cuteroxanthum** *S.* On wood. Beth. (S.).
24. **C. episphaeria** *S.* On *Hydnum, Radulum,* &c. (S.).
25. **C. fatiscens** *S.* On bark of *Syringa,* &c. Beth. (S.).
26. **C. fibrisedum** *S.* On dry wood. Beth. (S.).
27. **C. molliusculum** *S.* On *Betula carpinifolia.* (S.).
28. **C. nigrofuscum** *S.* On branches. Beth (S.).
29. **C. palmatum** *S.* On *Rhodendron maximum.* Beth. (S.).
30. **C. populinum** *S.* On *Populus Italica.* Beth. (S.); N. Y. (Peck).
31. **C. pyrinum** *S.* On *Pyrus coronaria.* Naz. (S.).
32. **C. rhois** *S.* On *Rhus glabra.* Beth. (S.).
33. **C. rosae** *S.* On *Rosa corymbosa.* Beth. (S.).
34. **C. sphaeriaemorphum** *S.* On *Quercus alba.* Beth. (S.).
35. **C. staphyleae** *S.* On branches of *Staphylea.* Beth. (S.).
36. **C. tumorum** *S.* On branches. Beth. (S.).

Gen. 4. ENSLINIA *Fr.*

1. **E. pocula** *Fr.* (*Sphaeria* Schw.). On ash bark. N. Y. (Schz.).
2. **E. candida** *Fr.* (*Sphaeria* Schw.). On ash branches. Car. (S.).
3. **E. Schweinitzii** *C.* (*Sphaeria intermedia* Schw.). On branches of *Prunus.* Beth. (S.).

Gen. 5. CORDIERITES *Mont.*

1. **C. concrescens** *S.* (*Peziza* Schw.). On the ground. Beth. (S.).
2. **C. irregularis** *S.* (*Peziza* Schw.). On fallen branches. Beth. (S.).
3. **C. muscoides** *B. & C.* On damp board. Penns. (Mich.).

Gen. 6. PATELLARIA *Fr.*

1. **P. atrata** *Fr.* On dry wood. Car. Rav.; S.), Virg. (Rav.); N. Eng. (Russell).
2. **P. proxima** *B. & Br.* On oak chips.
3. **P. indigotica** *C. & P.* On decorticated sticks. N. Y. (Peck; Gerard).
4. **P. nigro-olivacea** *Fr.* On wood.
5. **P. sphaerospora** *B. & C.* On old wood. Car. (Curt.).
6. **P. discolor** *Mont.* On *Polygonum Pennsylvanicum.* Car. (Curt.; Rav.); N. Y. (Peck).
7. **P. atrofusca** *B. & C.* On small twigs of *Vitis vulpina.* Orbicular, black-brown, with an elevated margin springing from a black thin stratum which surrounds the twigs; asci clavate; sporidia uniseriate, oblong, triseptate. Car. (Curt.).
8. **P. applanata** *B. & C.* Linn. Soc. Journ. On *Cornus succica.* Penns. (Mich.); Conn. (Wright); Car. (Curt.; Rav.); N. Eng. (Sprague).
9. **P. cylindrospora** *Ellis.* On sticks. N. J. (Ellis).
10. **P. olivaceovirens** *Fr.* On oak. Car. (Curt.).
11. **P. rhabarbarina** *Bech.* On *Cornus, Fagus* and *Rubus.* Car. (Rav. V. No. 46); Ala. (Peters); Penns. (Mich.); N. Eng. (Frost); N. Y. (Peck).
12. **P. fusispora** *C. & P.* On rotten wood. Sporidia uniseptate, brown. N. Y. (Peck 133).
13. **P. fenestrata** *C. & P.* On poplar branches. Sporidia large, pyriform, multiseptate, fenestrate, pale brown. N. Y. (Peck; Gerard).
14. **P. dispersa** *Gerard,* is too near the last, but without a more extended series of specimens we could not venture to pronounce them distinct.
15. **P. congregata** *B. & C.* On chestnut log. N. Y. (Peck).
16. **P. oleosa** *Cooke.* On decorticated twigs. Black, discoid, resembling *P. atrata.* Car. (Rav. 1678).
17. **P. aureococcinea** *B. & C.* On culms of *Andropogon.* (Grevillea iii.) Car. (Curt.); N. J. (Ellis).
18. **P. stygia** *B. & C.* On dead wood. Black, superficial, orbicular, with a raised margin, sporidia oblong, slightly attenuated at either end, uniseptate (.0005 in.). Car. (Bech.); N. Eng. (Sprague); N. J. (Bech.).
19. **P. Ravenelii** *B. & C.* (Grevillea, vol. iii.) Car. (Rav.).
20. **P. melaleuca** *Fr.* On dry *Corylus.* Car. (S.).

21. **P. melaxantha** *Fr.* On dry wood. Beth. (S.).
22. **P. lignyota** *Fr.* On wood. Beth. (S.).
23. **P. recisa** *B. & C.* N. Eng. (Frost).
24. **P. connivens** *Fr.* On fallen chips. Beth. (S.).
25. **P. lecideola** *Fr.* On dead limbs. Beth. (S.).
26. **P. verbasci** *S.* On stems of *Verbascum.* Beth. (S.).
27. **P. rhododendri** *S.* On branches of *Rhododendron.* Beth. (S.).

Gen. 7. SPLUNCTRINA *Fr.*

1. **S. tigillaris** *B. & Br.* (*S. Cornuta* C. & P.). On *Polyporus.*
2. **S. leucopoda** *Nyl.* On trunks. Car. (Curt.).
3. **S. gummae** *B. & C.* (*S. Cerasi* B. & C.). On cherry and peach gum. Car. (Curt.); N. Y. (Peck).
4. **S. microscopica** *B. & C.* On branches of *Morus multicaulis.* Car. (Curt.).
5. **S. minima** *B. & C.* On dead limbs of *Quercus.* Car. (Curt.).

Order IV. STICTIEI.

Gen. 1. PROPOLIS *Fr.*

1. **P. betuli** *Fr.* (*Peziza* Schwz.). On *Betula.* (S.)
2. **P. hysterina** *Fr.* On branches of various trees. Car. (Curt.); Conn. (Wright); Penns. (Mich.).
3. **P. rufa** *B. & C.* On dead branches. Irregular, erumpent, with a slightly raised border; hymenium rufous; sporidia oblong, slightly curved, obtuse, with a transparent border (.0013). Mass. (Russell); N. Eng. (Sprague).
4. **P. versicolor** *Fr.* On branches. Car. (Curt.; Rav.).
5. **P. farinosa** *Fr.* On disc of trunks. Beth. (S.).
6. **P. prominula** *S.* On *Vitis.* Beth. (S.).
7. **P. hyssopi** *S.* On stems of *H. nepetoides.* Beth. (S.).
8. **P. phacidioides** *Fr.* (*Peziza* Schwz.).

Gen. 2. XYLOGRAPHA *Fr.*

1. **X. parallela** *Fr.* On dead wood. Car. (Curt.).
2. **X. stictica** *Fr.* On wood. Beth. (S.).

This genus is claimed by Lichenologists. It is one of the intermediate genera about which difference of opinion is likely to exist.

Gen. 3. **STICTIS** *Fr.*

1. **S. chrysophaea** *P.* On decorticated branches. Beth. (S.).
2. **S. ocellata** *P.* On wood. Beth. (S.).
3. **S. pupula** *Fr.* On dead branches of *Viburnum* and *Syringa.* Car. (B. Rav.; Curt.).
4. **S. pallida** *Fr.* On old wood. Car. (S.).
5. **S. pelvicula** *Fr.* On branches of *Ribes.* Beth. (S.).
6. **S. hemispherica** *Fr.* On pine wood. Penns. (S.).
7. **S. glaucoma** *B. & C.* On *Viburnum opulus, Rosa rubiganosa* and *Kerria.* Orbicular, erumpent, margin obtuse; hymenium glaucous; sporidia filiform. Car. (Curt.).
8. **S. Sesleriae** *Lib.* Car. (Rav.).
9. **S. radiata** *Fr.* On dead branches. Car. (Curt.; Rav.); N. Y. (Peck).
10. **S. hydrangeae** *Schz.* On branches of *Hydrangea.* Virg. (Beth.); Beth. (S.).
11. **S. caulincola** *S.* On stems. Sporidia fusiform, at length triseptate .0008 in.). Beth (S.).
12. **S. hysterioides** *Desm.* On carex. N. Y. (Peck).
13. **S. Philadelphi** *S.* On branches of *Philadelphus.* Beth. (S.).
14. **S. ligustri** *Schz.* On branches of *Ligustrum.* Beth. (S.).
15. **S. rubi** *Schz.* On *Rubus villosus.* Beth. (S.).
16. **S. fimbriata** *Schz.* On scales of pine cones. Penns. (S.).
17. **S. umbellatarum** *Schz.* On stems of *Pastinaca.* Beth. (S.)
18. **S. ceracea** *Schz.* On stems. Beth. (S.)
19. **S. stella** *Schz.* On branches. Beth. (S.).

Gen. 4. **NAEVIA** *Fr.*

1. **N. tenuis** *Fr.* On bark of limbs. Car. (Curt.).

Gen. 5. **LICHENOPSIS** *Schz.*

1. **L. sphaeroboloidea** *Schz.* On dead branches of *Carya, Syringa,* oak, peach, &c. Car. (Schw.; Curt.; Rav.)

Order V. PHACIDIACEI.

Gen. 1. PHACIDIUM *Fr.*

1. **Ph. alneum** *Fr.* On alder branches. Beth. (S.).
2. **Ph. lacerum** *Fr.* On pine leaves. Penns. (S.).
3. **Ph. abietinum** *Schz.* On leaves of *Pinus strobus.* Naz. (S.).
4. **Ph. coronatum** *Fr.* On oak leaves. Car. (S.); Penns. (S.); Maine (Bolles); N. Y. (Gerard).
5. **Ph. dentatum** *Sch.* On oak leaves. Car. (Curt.).
6. **Ph. elegans** *B. & C.* On sheaths and stipules of pine. Car. (Curt.; Rav.).
7. **Ph. ilicis** *Lib.* (*P. multivalve* S.) On leaves of *Ilex opaca.* Salem (S.).
8. **Ph. trifolii** *Been.* On clover leaves. N. Eng. (Sprague).
9. **Ph. crustaceum** *B. & C.* N. Y. (Peck).

The following require verification:

10. **Ph. rhododendri** *Schz.* On leaves of *R. maximum.* Beth. (S.).
11. **Ph. exasperans** *Schwz.* On leaves of *Kalmia.* Beth. (S.).
12. **Ph. corticale** *Schwz.* On branches of *Rhododendron.* Beth. (S.).
13. **Ph. caulincola** *Schz.* On stems *Eupatorium*, &c. Beth. (S.).
14. **Ph. capsulare** *Schz.* On capsules of *Verbascum.* Beth. (S.).
15. **Ph. glandicola** *Schz.* On acorns. Beth. (S.).
16. **Ph. fraxineum** *Schz.* On leaves of *F. acuminta.* Beth. (S.).
17. **Ph. platani** *Schz.* On leaves of *Platanus.* Beth. (S.).
18. **Ph. quercinum** *Schz.* On oak leaves. Beth. (S.).

Gen. 2. TYMPANIS *Fr.*

1. **Tym. conspersa** *Fr.* On bark of *Pyrus.* Car. (S.); N. Eng. (Murray).
2. **Tym. alnea** *Fr.* On alder branches. Beth. (S.); N. Eng. (Frost); N.Y. (Peck).
3. **Tym. fraxini** *Fr.* On limbs of ash. Car. (S.).
4. **Tym. prunastri** *Fr.* On twigs of *Prunus.* Beth. (S.); Car. (S.); N. Eng. (Sprague); N. Y. (Peck).
5. **Tym. seriata** *S.* On decorticated wood. Beth. (S.).
6. **Tym. cinerascens** *Schz.* On bark. (S.); Car. (Curt.).
7. **Tym. plicatocrenata** *Fr.* On bark of *Prunus.* Car. (S.).

8. **Tym. fasciculata** *Schz.* On branches. Beth. (S.).
9. **Tym. rhabdospora** *B. & C.* N. Eng. (Sprague).
10. **Tym. stictica** *B. & C.* (*Tym. morsei* B. & C.). Maine (Morse).
11. **Tym. punctoidea** *Cooke.* On bark. Minute, erumpent, punctiform, black, coriaceous, often seriate; cups solitary, or 2–3 together, compressed and irregular, shortly stipitate; disc concave, laterally compressed when dry; asci subcylindrical; sporidia elliptic, brown. Car. (Rav. 1906 b.).
12. **Tym. gyrosa** *B. & C.* On bark of *Ilex prinoides.* N. Eng. (Russell).
13. **Tym. picastra** *B. & C.* On bark of *Ilex prinoides.* Car. (Curt.); N. Y. (Peck).
14. **Tym. pinastri** *Fr.* On pine branches. Beth. (S.); Car. (Curt.); N. Eng. (Sprague); N. Y. (Peck; Gerard).
15. **Tym. arctica** *Fr.* On leaves of *Andromeda.* (S.).
16. **Tym. andromedae** *Curt.* On bark of *A. arborea.* Car. (Curt.).
17. **Tym. turbinata** *Schz.* On *Diervillea.* Beth. (S.).
18. **Tym. viticola** *Fr.* On bark of grape vine. Car. (Curt.).
19. **Tym. Ravenelii** *B. & C.* On *Carpinus.* Car. (Rav. iv., 66).

Gen. 3. RHYTISMA *Fr.*

1. **Rhy. acerinum** *Fr.* On leaves of *Acer rubrum.* Car. (S.; Curt.; Rav.); Maine (Bolles); N. Y. (Peck).
2. **Rh. punctatum** *Fr.* On leaves of *Acer saccharinum.* Car. (S.); Beth. (S.); Maine (Bolles); N. Eng. (Russell); N. Y. (Peck).
3. **Rh. salicinum** *Fr.* On leaves of *Agalea, Salix,* &c. Beth. (S.); Car. (Curt.); N. Y. (Peck).
4. **Rh. velatum** *Fr.* On leaves of *Ilex prinoides.* Car. (S.).
5. **Rh. ilicincola** *Fr.* On leaves of *Ilex prinoides.* Car. (S.; Curt.).
6. **Rh. canadensis** *S.* On leaves of *Ilex canadensis.* (S.); N. Y. (Peck).
7. **Rh. Curtisii** *B. & R.* On leaves of *Ilex opaca.* Car. (Curt.; Rav.).
8. **Rh. prini** *Fr.* On leaves of *P. verticillatus.* Car. (S.); Penns. (S.); N. Y. (Peck).
9. **Rh. juglandis** *Schz.* On walnut leaves. Beth. (S.).
10. **Rh. vaccinii** *Fr.* On leaves of *Vaccinium.* Car. (S.; Curt.); N. Eng. (Sprague); N. Y. (Peck).
11. **Rh. andromedae** *Fr.* On leaves of *A. polifolia.* N. Eng. (S.); N. Y. (Peck).

12. **Rh. decolorans** *Fr.* On leaves of *Androm. ligustrina.* Car. (S.; Curt.); N. Eng. (Sprague); N. Y. (Peck).
13. **Rh. vitis** *Schz.* On leaves of *Vitis.* Car. (S.; Curt.); Penns. (S.).
14. **Rh. magnoliae** *Schz.* On leaves of *M. glauca.* Penns. (S.).
15. **Rh. Blakei** *Curt.* N. Y. (Peck).
16. **Rh. asteris** *Schz.* On leaves of *Aster.* Car. (S.; Curt.); Penns. (S.); Maine (Bolles).
17. **Rh. sassafras** *Schz.* On leaves of sassafras. Car. (S.).
18. **Rh. solidaginis** *Schz.* On leaves of *Solidago.* Beth. (S.); Car. (Curt.); N. Eng. (Sprague); Conn. (Wright); N. Y. (Peck; Gerard).
19. **Rh. bifrons** *Schz.* On leaves of *Solidago sempervirens.* N. Y. (S.).
20. **Rh. cacti** *Schz.* On rotting *Opuntia.* Salem (S.); Car. (S.).
21. **Rh. confluens** *Fr.* On stems *Eupatorium*, &c. Car. (S.).
22. **Rh. elevatum** *Schz.* On stems. Beth. (S.).
23. **Rh. silphii** *Schz.* On stems of *Silphium.* Naz. (S.).
24. **Rh. seriale** *Schz.* On hickory wood. Beth. (S.).
25. **Rh. corrugatum** *Schz.* On dry wood. Car. (S.).
26. **Rh. robiniae** *Schz.* On leaves of *Robinia.* Naz. (S.).
27. **Rh. smilacis** *Schz.* On *Smilax.* Car. (S.); Penns. (S.).

Gen. 4. DICHAENA *Fr.*

1. **D. rugosa** *Fr.* On oak limbs. Car. (Curt.; Rav.).
2. **D. faginea** *Fr.* On beech bark. Car. (Curt.); N. Y. (Peck); Ohio (Lea).
3. **D. smilacina** *Schz.* On *Smilax.* Car. (S.).
4. **D. caespitosa** *Schz.* On bark of *Fagus.* N. Eng. (S.).

Order VI. HYSTERIACEI.

Gen. 1. OSTREICHNION *Duby.*

1. **O. Americanum** *Dby.* Car. (Rav.).

Gen. 2. MYTILINIDION *Duby.*

1. **M. aggregatum** *Dby.* On wood. Beth. (S.)

Gen. 3. LOPHIUM *Fr.*

1. **L. naviculare** *Schz.* On wood. Beth. (S.).
2. **L. sassafras** *Schz.* On bark of sassafras. Penns. (S.).

Gen. 4. TRIBLIDIUM *Fr.*

1. **Trib. rufulum** *Spr.* On bark of *Rhus, Melia,* &c. Car. (Curt.; Rav.).
2. **Trib. insculptum** *Cooke.* On hickory twigs. Gregarious, erumpent, black, coriaceous, discoid; disc plane, connivent when dry and then linear or trigonous; asci short, broad, clavate; sporidia fusoid, coni-septate, constricted, brown; paraphyses clavate, tips brownish. N. J. (Ellis 2111).
3. **Trib. calicilform** *Reb.* Beth. (S.).
4. **Trib. syringae** *Sch.* (*Trib. dealbatum* Gerard). Beth. (S.); N. Y. (Gerard).
5. **Trib. hiascens** *B. & C.* On *Quercus.* Superficial, free, short, elliptic, brownish black, lips incurved; disc open; sporidia elliptic, muricate (.0013–.0016 in. long). Car. (Curt.); N. Y. (Peck).

Gen. 5. HYSTERIUM *Fr.*

1. **H. pulicare** *Fr.* On bark and old wood. Car. (Curt.); N. Eng. (Frost); N. Y. (Peck; Gerard); Penns. (S.).
2. **H. angustatum** *Walh.* On twigs, bark, &c. N. Y. (Peck); Ohio (Lea).
3. **H. teres** *Schz.* On wood of *Rhododendron.* Car. (S.); Penns. (S.).
4. **H. tortile** *Schz.* On bark of cedar. Car. (S.); N. Y. (Peck; Gerard).
5. **H. complanatum** *Dby.* On wood.
6. **H. insidens** *Schz.* On dried wood. Car. (S.); N. Y. (Peck; Gerard).
7. **H. magnosporum** *Howe.* On decorticated hickory. N. Y. (Howe).
8. **H. mori** *Schz.* On wood of *Morus.* Beth. (S.); N. Y. (Gerard).
9. **H. acuminatum** *Fr.* On sassafras wood. Beth. (S.).
10. **H. rimincola** *Schz.* In cracks of *Diervilloea.* Beth. (S.)
11. **H. betulignum** *Schz.* On birch bark and wood. Car. (Curt.); Beth. (S.).
12. **H. ellipticum** *Fr.* On bark. Car. (S.).
13. **H. fibrisedum** *Gerard.* On wood. N. Y. (Peck).
14. **H. praelongum** *Schz.* On rotten wood. Car. (S.); Penns. (S.).
15. **H. varium** *Fr.* On bark. Car. (Curt.).
16. **H. fusiger** *B. & C.* On dry wood. N. Eng. (Sprague).
17. **Hys. Rousselii** *Duby.* On wood. N. Y. (Peck; Gerard).

18. **H. truncatulum** *C. & P.* On wood. Gregarious, superficial, elliptical, abruptly rounded at the ends, straight, longitudinally striate, flattened along the apex (1 m. m. long, 0.5 m. m. broad), lips closely connivent, asci clavate, shortly stipitate; sporidia biseriate, fusiform, rounded at the ends, triseptate, ultimate cells shorter, hyaline, central cells brown (.035–.04 × .01 m. m.). N. Y. (Peck 165).

19. **H. hyalinum** *C. & P.* On wood of deciduous tree. Erumpent, then superficial, following the fibres of the wood, somewhat parallel, linear, narrow, rounded at the ends (1–2 m. m. long), straight, faintly striate; lips acute, scarcely closed; asci cylindrico-clavate, sporidia uniseriate or biseriate, fusiform, triseptate hyaline (.026–.028 × .006–.008 m. m.). N. Y. (Peck 47).

20. **H. variabile** *C. & P.* On old chestnut posts, &c. Erumpent, then superficial, following the interstices of the woody fibres of the matrix, narrowly elliptical or linear and elongated, straight or flexuous, often parallel, faintly striate-rugose, flattened along the apex, slightly narrowed at each end, lips closely connivent; asci cylindrical, stipitate, sporidia uniseriate, very variable in size and form, ovate or elliptic or broadly clavate constricted in the center 5–7 septate, at length with longitudinal divisions, dark brown. N. Y. (Peck 21).

21. **H. gerardi** *C. & P.* On chestnut twigs, &c. Gregarious, superficial, oblong or linear, narrowed towards the ends, lying in various directions, straight or flexuous, or somewhat contorted (1–2 m. m.), lips prominent, closely connivent; asci clavate, sporidia biseriate, elliptic, triseptate with 1–2 transverse septa, brown (.02 × .01 m. m.). N. Y. (Peck 123).

22. **H. thuiarum** *C. & P.* On *Thuja.* Subgregarious, superficial, perithecia elliptic, acuminate, elevated, almost naviculoid, longitudinally striate, blade, opaque, lips prominent, closely connivent; asci cylindrical, sporidia broadly lanceolate, obtuse 3–5 septate, brown (.038–.04 × .01–.012 m. m.). N. Y. (Peck).

23. **H. viticolum** *C. & P.* On stems of *Vitis.* Perithecia superficial, ovate or elliptical, sometimes elongated, rounded at the ends, in long parallel lines rarely scattered, or densely gregarious, and then flexuous, dull opaque black, with a depressed line on either side, lips narrow connivent; asci short, clavate stipitate, sporidia biseriate, elongated elliptical, constricted in the center 3–5 septate, some of the cells transversely septate, brown. N. Y. (Peck 124).

24. **H. clavisporum** *C. & P.* On culms of reed. Innate, then erumpent, splitting the cuticle, which for a long time is adherent, perithecia elliptic or linear acuminate, opaque, arranged in long parallel lines, lips closely connivent; asci clavate stipitate, sporidia crowded, clavate, straight or curved multiseptate (9 or more), yellow or yellowish brown. N. Y. (Peck 105).

25. **H. elongatum** *W.* On dry wood. Car. (Curt.); Beth. (S.); Ohio (Lea).

26. **H. vulvatum** *Schz.* On various branches. Car. (Burt.; Rav.); N. Eng. (Frost); N. Y. (Peck; Gerard).

27. **H. depressum** *B. & C.* On dry wood. Elongated, rough with little granules, depressed, disc extremely narrow; asci clavate, sporidia cymbaeform, with about five septa, sometimes bulging in the center on the convex side (.0016 in long). Car. (Curt.).

28. **H. fraxini** *Fr.* On ash. Car. (Curt.); N. Y. (Peck); Beth. (S.).

29. **H. flexuosum** *Schz.* (Not of Ravenel or Duby.) Car. (S.); Penns. (S.).

30. **H. Curtisii** *Dby.* On *Vitis.* Car. (Curt.).

31. **H. elatinum** *P.* On dry wood. Car. (S.); Penns. (S.).

32. **H. smilacis** *Schz.* On smilax. Car. (Curt.); N. Y. (Peck); Penns. (S.).

33. **H. cinerascens** *Schz.* On naked wood of *Juglans.* Beth. (S.).

34. **H. chlorinum** *B. & C.* On *Quercus.* Superficial, elevated from the bark, often narrowed at the base, elliptic, at first greenish, from a powdery coat, which soon wears off, lips sulcate, disc greenish, sporidia biseriate, oblong, uniseptate, constricted in the middle (.003 in long), endochrome frequently emarginate. Car. (Curt.); Ala. (Beaumont).

35. **H. cyrillae** *B. & C.* On twigs of *Cyrilla.*

36. **H. verbasci** *Schz.* On stems of *verbascum.* Beth. (S.). N. Y. (Peck).

The following require identification:

37. **H. castaneae** *Schz.* On chestnut wood and bark. Car. (S.).

38. **H. kalmiae** *Schz.* On wood of *K. latifolia.* Car. (S.).

39. **H. rhois** *Schz.* On wood of *Rhus typheria.* Beth. (S.).

40. **H. confluens** *Schz.* On stems of *Rubus.* Beth. (S.).

41. **H. fibritectum** *Schz.* On old willow wood. Beth. (S.).

42. **H. rugulosum** *Schz.* On willow wood. Beth. (S.).

43. **H. vaccinii** *Schz.* On branches of *V. frondosum.* Car. (S.).

44. **H. nucicola** *Schz.* On putrid nuts. Beth. (S.).

45. **H. librincola** *S.* On stems of *Asclepias.* Beth. (S.).

Gen. 6. GLONIUM *Sch.*

1. **Gl. stellatum** *Muhl.* On stumps. Penns. (S.); Car. (Curt.; Rav.); N. Eng. (Frost); N. Y. (Peck); var. *accumulatum* Schz. Beth. (S.).

2. **Gl. graphicum** *Fr.* On sassafras. Beth. (S.).

3. **Gl. lineare** *Not.* On wood. Penns. (S.); Car. (Curt.); N. Y. (Gerard; Peck); Conn. (Wright); N. Eng. (Frost).

4. **Gl. parvulum** *Gerard* (sub *Hysterium*). New York (Gerard).

Gen. 7. ANGELINA *Fr.*

1. **A. rufescens** *Dby.* On rotten wood. Car. (S.; Curt.; Rav.). N. Y. (Peck).

2. **A. nigro-cinnabarina** *B. & C.* Beth. (S.); Car. (Rav.)

Gen. 8. HYPODERMA *Dby.*

1. **H. illicinum** *Not.* N. Y. (Peck).

2. **H. virgultorum** *Dl.* N. Y. (Peck); var. *Rubi.* On bramble. Car. (Curt.); N. Y. (Peck); Penns. (S.); var. *petiolare.* On petioles. N. Y. (Gerard; Peck).

3. **H. commune** *Fr.* On dead stems. Beth. (S.); Car. (Curt.); N. Eng. (Frost); N. Y. (Peck).

4. **H. expallens** *Schz.* On stems. Beth. (S.).

5. **H. nervisequum** *Desz.* On pine leaves. (*Phytisma lineare* Peck); N. Y. (Peck).

6. **H. scirpinum** *Fr.* On *Scirpus.* N. Y. (Peck).

7. **H. variegatum** *Dby.* On petioles of oak leaves. Car. (Curt.).

8. **H. conigenum** *M. & N.* On fir cones. Beth. (S.).

9. **H. polygonati** *Schz.* On herbaceous stems.

10. **H. plantarum** *Schz.* On *Monotropa.* Beth. (S.); Penns. (S.).

11. **H. rufilabrum** *Dby.* On *Acer striatum.* New Eng. (Dby.).

Gen. 9. ACTIDIUM *Fr.*

1. **A. caricinum** *Schz.* On *Carices.* Beth. (S.).

Gen. 10. LOPHODERMIUM *Chev.*

1. **L. sphaeorides** *A. & S.* On leaves. N. Y. (Peck).
2. **L. xylomoides** *Chev.* On leaves. Car. (S.).
3. **L. punctiforme** *Fr.* On leaves of oak. Beth. (S.).
4. **L. maculare** *Not.* On leaves. N. Y. (Peck.).
5. **L. piuastri** *Chev.* On pine leaves. Penns. (S.); Car. (Curt.); N. Eng. (Sprague); N. Y. (Peck).
6. **L. arundinaceum** *Chev.* On reeds. Car. (S.); Maine (Morse); var. *graminum.* On grasses. Beth (S.).
7. **L. typhinum** *Fr.* On *Typha.* N. Y. (Peck); Beth. (S.).
8. **L. exaridum** *C. & P.* On leaves of *magnolia.* Superficial, seated on irregular bleached spots; receptacles elliptical, minutely rugose, black, opaque; lips elevated, paler, connivent; asci clavate, sporidia filiform, hyaline. N. Y. (Peck).

Gen. 11. SPOROMEGA *Corda.*

1. **S. griseum** *Schz.* On *smilax* twigs. Beth. (S.).

Gen. 12. COCCOMYCES *Not.*

1. **C. tumida** *Not.* On oak leaves. Beth. (S.).
2. **C. (?) rhododendri** *Schz.* On Rhododendron leaves. Beth. (S.). [This is possibly *Lophodermium sphaeroides* A. & S.]

Gen. 13. COLPOMA *Walr.*

1. **C. quercinum** *Walr.* On oak branches. Car. (Curt. S.).
2. **C. Azaleae** *Schz.* On *Azalea.* N. Y. (Peck; Gerard); Beth. (S.).
3. **C. juniperinum** *C. & P.* On juniper branches. (Hys.; *Petersii* B. & C.?). Gregarious, oblong, elliptic, or slightly elongated, covered by the cuticle, which is ultimately fissured in an irregular manner, blackish, disc pulled, at length exposed; asci clavate, sporidia filiform, paraphyses slender, at first circinate or curled at the tips. N. Y. (Peck).

Gen. 14. **OSTROPA** *Fr.*

1. **O. cinerascens** *Schz.* On wood of *Liriodendron*. Beth. (S.).
2. **O. hysterioides** *Sch.* On bleached oak. Beth. (S.).
3. **O. rugulosa** *Schz.* On trunks. Penns. (S.).
4. **O. sphaerioides** *Schz.* On wood. N. Eng. (S.).

It is not assumed by any means that this synopsis is perfect and complete. Errors are readily made, and verification is not easily accomplished with the waters of the Atlantic rolling between us; yet it is hoped that approximate accuracy has been attained with the material at our disposal. For additions, suggestions, and corrections, we shall always be thankful, and if names have been unintentionally omitted, or any doubt should arise as to the accuracy of our determinations, it will always be our desire to revise any error if such can be demonstrated, since our object is the advancement of science, and not the perpetuation of error. All American mycologists are urged to assist us in the same spirit.

2 Grosvenor Villas,
Junction Road, Upper Holloway, London.

V. A List of the North American Syrphidae

BY CH. R. OSTEN SACKEN.

[*Read before this Society, Nov.* 5, 1875.]

In this second instalment of a new Catalogue of North American Diptera,[1] I have followed, in the main, the plan of the first, to which I refer for the necessary explanations. This part, perhaps more than the first, bears the double character of a compilatory and synonymical catalogue. It brings together all the species, published before and after my catalogue of 1858; at the same time, it gives the synonymy, as far as I have succeeded in working it out. My success in this respect depended, of course, on the material at my command, and as the collections within my reach are almost exclusively from the United States, that part of the catalogue is better purged of synonymy than the lists of the Cuban and Mexican species.

The species, as far as practicable, are referred to the proper genera. Species which I do not know, nor could identify, even generically, from the descriptions, were, of course, left where I found them.

I deemed it useful to add, in the notes, references to Mr. Loew's numerous monographic papers on European genera, the study of which papers will be indispensable in working up the corresponding American genera. Some other notices and references which I give, may also be welcome to the student. Among them I will mention the data about the geographical distribution of the species, which I have collected wherever I could.

The total number of described *Syrphidae* from North America, north of Mexico, and exclusive of California, which are actually identified and contained in our collections, is now about one hundred and sixty. Of this number, ninety-one species, that is, more

[1] The first was: A List of the *Leptidae*, *Mydaidae* and *Dasypogonina* of North America, published in this Bulletin in October, 1874.

than one-half, have been added since my list of 1858. They are not all new species, some few among them being European species, whose occurrence in North America has been since averred.

The number of described *Syrphidae* from California, whether identified or not, is only eleven.

Of the ten new species described in the appendix, *Xanthogramma*, two *Brachyopae* and *Arctophila*, represent genera hitherto not recorded in North America.

I am under obligations to Mr. J. H. Verrall, in London, for some notices concerning Mr. Walker's species, and I have credited them to him, whenever they were new to me. In the sequence of the genera I have followed Schiner, not having been able yet to investigate the subject independently.

The comparison of the European and North American *Faunae of Syrphidae*, leads to the following results:

1. With but few exceptions, all the European genera occur in North America. The exceptions are a number of the smaller genera (with only one or two species), some of which may be discovered yet on this side of the Ocean. Such are Callicera, Psarus, Spatigaster, Petecocera, Platynochaetus, Plocota.

2. Most of the genera, common to both continents, except the very small ones, are much richer in species in Europe than in North America. This disproportion may partly be accounted for by the fact that some of the genera have been very little studied in America. This applies to Pasagus, Pipija, Chrysogaster and especially Chilosia (the latter in Europe numbers eighty-seven species, while only seven are known from North America). But Merodon (thirty-four Europeans against two doubtful Americans) and Eumeous (thirty-four Europeans against a single doubtful American), require another explanation. They belong to the South of Europe and hardly reach Sweden; whereas the forms common to both continents are generally northern, circumpolar forms. Both modes of explanation fail, however, with regard to Syrphus (seventy Europeans against eleven or twelve Americans) and the allied genera. Melanostoma, Platychirus and Sphaerophoria (which number in the aggregate about forty-five European species against eight

Americans). These are northern forms, abundantly represented in Sweden, and as in the northern United States we can expect a few, but not many additions in them, the poverty of the fauna becomes clearly apparent. We may conclude by saying in general that North America, as far as our figures go, seems poorer in *Syrphidae* than middle and northern Europe. Our data, it is true, especially refer to the northern regions of this continent. If the Southern States were better explored, and if, as an equivalent for the Mediterranean fauna of Europe, Mexico and the West Indies were thrown in, with their numerous species of *Eristalis* and *Voludella* the balance would be, of course, somewhat restored in favor of America. Still, this relative poverty of the northern regions of North America in *Syrphidae* is worth noticing, especially if we recall the fact that in the Tabanidae, Tipulidae, Dolichopodidae and other families, these regions fully equal, and often surpass Europe in the number of species.

3. The genera peculiar to America are as follows: *Mesograpta*, closely allied to *Syrphus*, is represented by six species in the United States and by many more in the tropics. To *Mixtemyia*, hitherto represented by a single species, not rare in the northern States of the Union, I have added in the appendix a second species from Mexico. The genera *Allograpta* and *Teuchocnemis* which I propose, will also probably be increased by the addition of southern species; *Pteroptila*, *Lepidomyia* and *Pterallastes* belong in the same category. *Ceratophyia*, *Mixogaster*, *Somula* and *Polydonta* close the list of genera peculiar to America. Except *Mesograpta*, all these genera are hitherto represented by very few species, most of them by a single one.

4. Of the one hundred and sixty *Syrphidae* from the United States, north of Mexico and exclusive of California, which are described and actually identified in our collections, about twenty-five are species common to Europe and North America.

Family **SYRPHIDAE.**

MIXOGASTER.

Macquart Dipt. Exot. II, 2, p. 14, 1842.

mexicanus *Macquart*, Dipt. Exot. 1er Suppl. p. 123; Tab. X, fig. 15. Mexico.

CERATOPHYIA.

Wiedemann, Anal. Ent. 1824; Auss. Zw. II, p. 79; Tab. IX, fig. 5, 1830.

fuscipennis *Macquart*, Hist. Nat. Dipt. I, p. 488, 3. Philadelphia.
Microdon Agapenor Walker, List, etc., III, p. 539. Georgia. [Synonymy in Walker, List, etc., IV, p. 11, 57, where a new generic name, *Mesophila*, is proposed.]

MICRODON.[1]

Meigen, Illig. Mag. II, 1803; *Aphritis* Latreille, 1804.

aurulentis *Fabricius*, Syst. Antl. p. 185, 8 (*Mulio*); Wiedemann, Auss. Zw. II, p. 86, 10; Macquart, Dipt. Exot. II, 2, p. 12, 4; Tab. II, fig. 1 (*Aphritis*). Carolina (M. C. F. has a specimen from Illinois, which may belong here).

***Caliopterus** *Loew*, Centur. X, 56. Texas.

***coarctatus** *Loew*, Centur. V, 47. Distr. Columbia.

***fulgens** *Wiedemann*, Auss. Zw. II, p. 82, 1; Macquart, Dipt. Exot. 1er Suppl. p. 122 (*Aphritis*). Georgia (Wied.); Florida; Guyana (Macq.).
Microdon englossoides Gray, in Griffith's Animal Kingdom; Ins. II; Tab. 125, fig. 2. [Synonymy in Walker, List, etc., III, p. 538.]

***globosus** *Fabricius*, Syst. Antl. p. 185, 9 (*Mulio*); Wiedemann, Auss. Zw. II, p. 86, 11; Macquart, Dipt. Exot. II, 2, p. 12, 5; Tab. I, fig. 4 (*Aphritis*). Carolina (Fab.); United States.
Dimeraspis podagra Newman, Ent. Mag. V, p. 373. [Synonymy in Walker, List, etc., III, p. 540.]

rufipes *Macquart*, Dipt. Exot. II, 2, p. 11; Tab. II, fig. 3 (*Aphritis*). Philadelphia.

***tristis** *Loew*, Centur. V, 45. Virginia (Lw.); New York and northward, as far as Mackenzie River.

***inaequalis** *Loew*, Centur. VII, 70. Cuba.

***laetus** *Loew*, Centur. V, 46. Cuba.

***trochilus** *Walker*, Dipt. Saund. III, p. 216. Mexico.

[**Chymophila splendens** *Macquart*, Hist. Nat. Dipt. I, p. 486; Tab. XI, fig. 3 (1834); Dipt. Exot. II, 2, p. 10; Tab. I, fig. 2. Philadelphia. Mr. Bigot, in whose possession the typical specimen of Macquart's description now is, makes the following statement about it (Annales de la Soc. Entom. de France, 1858, p. 590): "The head of this specimen is glued on, and resembles that of Conops, while the body is that of an exotic *Microdon*." We may pretty safely, therefore, strike out this genus and species from among the number of existing forms.]

CHRYSOTOXUM.(2)

Illiger's Magaz. II, 1803.

***derivatum** *Walker*, List, etc., III, p. 542. Huds. B. Terr.; Yukon River, Alaska; Colorado Mts.

flavifrons *Macquart*, Dipt. Exot. II, 2, p. 17, 2; Tab. III, fig. 2. Newfoundland.

***laterale** *Loew*, Centur. V, 42. Nebraska.

***pubescens** *Loew*, Centur. V, 43. Illinois.

***ventricosum** *Loew*, Centur. V, 44. Distr. Columbia.

---

nigrita *Fabricius*, Ent. Syst. IV, p. 292, 49 (*Syrphus*); Syst. Antl. p. 183, 1 (*Mulio*); Wiedeman, Auss. Zw. II, p. 88, 2. Jamaica.

Observation.—Besides the above-named species of *Chrysotoxum*, the following European species are quoted as occurring in North America:

bicinctum *Meigen*, by Mr. Loew in Neue Dipterol. Beitr. III, p. 18, together with *Helophilus pendulus*, *versicolor* and *florens*, also European species. The statement about *Chr. bicinctum* is repeated by Loew, Verh. Zool. Bot. Ver. 1856, p. 614. None of these species has ever been found in N. A. since, and the statement seems to be based on an error of locality.

fasciolatum *Degeer*, according to Walker, List, etc., III, p. 541, was found in Huds. B. Terr. I would not trust the statement without comparing the specimens.

PARAGUS.

Latreille, Hist. Nat. Const. et Ins. XIV, p. 358, 1804.

aeneus(3) *Walker*, List, etc., III, p. 545. Ohio.

*__angustifrons__ *Loew*, Centur. IV, p. 164. Virginia.

bicolor *Fabricius*, Meigen, etc. Europe and North America. [Loew in litt.]

*__dimidiatus__ *Loew*, Centur. IV, 63. Distr. Columbia.

transatlanticus *Walker*, List, etc., III, p. 544. Trenton Falls.

PIPIZA.

Fallén, Dipt. Suec. Syrphi. 58, 1816.

buccata *Macquart*, Dipt. Exot. II, 2, p. 107; Tab. XVIII, fig. 2. Carolina.

*__calcarata__ *Loew*, Centur. VI, 42. New York.

*__femoralis__ *Loew*, Centur. VI, 38. Illinois.

*__fraudulenta__ *Loew*, Centur. VI, 41. Illinois.

*__nigribarba__ *Loew*, Centur. VI, 40. New York.

radicum *Riley*, 1st Rep. p. 121, fig. 66; Amer. Entomologist, I, p. 83. Illinois.

*__salax__ *Loew*, Centur. VI, 39. Pennsylvania.

---

divisa *Walker*, Trans. Ent. Soc. N. Ser. IV, p. 156. Vera Cruz.

PSILOTA.

Meigen, Syst. Beschr. III, p. 256, 1822.

flavidipennis *Macquart*, Dipt. Exot. 5e Suppl. p. 97; Tab. V, fig. 5 (compare the remark in Loew, Monogr. I, p. 27). Philadelphia.

TRIGLYPHUS.

Loew, Oken's Isis. 1840, p. 512.

*__modestus__ *Loew*, Centur. IV, 62. New York.

*__pubescens__ *Loew*, Centur. IV, 61. Wisconsin.

CHRYSOGASTER.(4)

Meigen, Illiger's Magaz. II, 1803.

Antithcus *Walker*, List, etc., III, p. 572. New York.

Apisaon *Walker*, List, etc., III, p. 572. New York.

***latus** *Loew*, Centur. IV, 59. British North America.

***nigripes** *Loew*, Centur. IV, 60. New York.

recedens *Walker*, Dipt. Saund. III, p. 228. United States.

ORTHONEURA.

Macquart, Hist. Nat. Dipt. I, p. 563, 1834.

***nitida** *Wiedemann*, Auss. Zw. II, p. 116, 1 (*Chrysogaster*). North America.
Cryptineura hieroglyphica Bigot, Rev. et Magaz. de Zool. 1859.

***pictipennis** *Loew*, Centur. IV, 58. New York.

***ustulata** *Loew*, Centur. IX, 80. Orange, N. J.

CHILOSIA.[5]

Cheilosia, Meigen, Syst. Beschr. III, p. 296, 1822.

?Aesyctes *Walker*, List, etc., III, p. 591 (*Syrphus*). Huds. B. Terr.

***capiliata** *Loew*, Centur. IV, 65. Distr. Columbia.

***comosa** *Loew*, Centur. IV, 66. British America.

***cyanescens** *Loew*, Centur. IV, 67. Illinois.

latrans *Walker*, List, etc., III, p. 575 (*Syrphus*). Huds. B. Terr.

***leucoparea** *Loew*, Centur. IV, 69. Carolina.

oestriformis *Walker*, List, etc., III, p. 573 (*Syrphus*). Huds. B. Terr.

***pallipes** *Loew*, Centur. IV, 70. Distr. Columbia.

***plumata** *Loew*, Centur. IV, 68. Virginia.

***tristis** *Loew*, Centur. IV, 71. Red River of the North.

MELANOSTOMA.

Schiner, Wiener Entom. Monatschr. IV, p. 213, 1860.

ambigua (*Fallén* ?) *Zetterstedt*, Ins. Lapp. p. 608, 38 (?), Dipt. Scand. II, p. 757, 60 (?); variety in Stäger Groenl. Antl. p. 361, 29 (?). [The quotations and queries are Schiödte's, in the Berl. Ent. Zeitschr. 1859, p. 153.] Greenland.

***scalaris** *Fabricius*, Panger, etc. (*Syrphus*). Europe and North America (common).

Syrphus mellinus (Linné), Fabricius, Meigen, etc. See description in Schiner, Fauna Austr. Dipt. I, p. 291.

*obscura *Say*, Amer. Entomol. I; Tab. XI (*Syrphus*); Wiedemann, Auss. Zw. II, p. 131. United States.

Observation.—*M. gracilis* Meig. and *M. maculosus* Meig., both European, are stated to occur in N. America by Mr. Walker, List, etc., III, p. 88–589. Mr. Verrall informs me that "those two species are synonyms of *M. scalaris* Fab. But Mr. Walker's *Syrphus maculosus* has two representatives in the British Museum, both *Platychiri*, one *resembling P. immarginatus* Zett., the other *resembling P. scambus* Stäger."

PLATYCHIRUS.

Platycheirus St. Fargeau et Serv. Encycl. Méth. X, p. 513, 1825.

*hyperboreus *Stäger*, Groenl. Antl. p. 362, 30 (*Syrphus*). Greenland (Stäger); Pennsylvania, Virginia, etc. (M. C. Z.).

naso *Walker*, Dipt. Saund. p. 240. North America. (*Platychirus*—Verrall in litt.)

*quadratus *Say*, Journ. Acad. Phil. III, p. 90, 4 (*Scaeva*); Wiedemann, Auss. Zw. II, p. 135, 32 (*Syrphus*). United States.

Syrphus fuscanipennis Macquart, Dipt. Exot. 5e Suppl. p. 95, 58.

*peltatus *Meigen*, Syst. Beschr. III, p. 334. Europe; North America (Sitka, according to Loew; Western New York, in M. C. Z.).

PYROPHAENA.

Schiner, Wiener Entom. Mon. IV, p. 213, 1860.

*ocymi *Fabricius*, Panger, Meigen, Syst. Beschr. III, p. 337. Europe; North America (Massachusetts, White Mts., N. H., Quebec; Athabasca Lake, etc.).

*rosarum *Fabricius*, etc., Meigen, Syst. Beschr. III, p. 338. Europe; North America (Massachusetts; White Mts., N. H.).

LEUCOZONA.

Schiner, Wiener Entom. Mon. IV, p. 214, 1860.

*lucorum *Linné*, etc., Meigen Syst. Besch. III, p. 313; Tab. 30, fig. 27; Curtis, Brit. Ent. 753. Europe; North America (British Possessions, Quebec).

SYRPHUS.(6)

Fabricius, Syst. Ent. 1775.

*abbreviatus (*Zetterstedt*), *Schiner*, Fauna Austr. I, p. 311; O. Sacken, Proc. Bost. Soc. N. H. 1875. Europe and North America (Massachusetts).

adolescens *Walker*, List, etc., III, p. 584. Huds. B. Terr.; Nova Scotia.

alcidice *Walker*, List, etc., III, p. 579. Huds. B. T.

*amalopis *O. Sacken*, Proc. Bost. Soc. N. H. 1875. White Mts., N. H.

*americanus *Wiedemann*, Auss. Zw. II, p. 129; O. Sacken, Proc. Bost. Soc. N. H. 1875. United States (Massachusetts; Michigan; Texas); British Possessions.

*contumax *O. Sacken*, Proc. Bost. Soc. N. H. 1875. White Mts., N. H.

*diversipes *Macquart*, Dipt. Exot. 4e Suppl. p. 155, 54; O. Sacken, Proc. Bost. Soc. N. H. 1875. White Mts., N. H. (common); Catskill Mt. House, N. Y.; Lake Superior; Newfoundland (Macq.).

? Syrphus cinctellus Zetterstedt, Schiner, etc. Europe.

dimidiatus *Macquart*, Hist. Nat. Dipt. II, p. 537, 10. Georgia.

*geniculatus *Macquart*, Dipt. Exot. II, 2, p. 101, 24; Tab. XVII, 5; O. Sacken, Proc. Bost. Soc. N. H. 1875; Newfoundland (Macq.); White Mts., N. H.

*lapponicus *Zetterstedt*, Dipt. Scand. II, p. 701, 3; Häger, Groenl. Antl. p. 360, 28. Europe and North America (Greenland; White Mts., N. H.).

? Scaeva affinis Say, J. Acad. Phil. III, p. 93, 9; Wiedemann, Auss. Zw. II, p. 117, 2. Arkansas (Say).

? Syrphus Agnon Walker, List, etc., III, p. 579. Nova Scotia; Huds. B. Terr.

? Syrphus arcuicinctus Walker, List, etc., III, p. 580. Huds. B. Terr. [About this synonymy, compare O. Sacken, Proc. Boston Soc. N. H. 1875.]

*Lesueurii *Macquart*, Dipt. Exot. II, 2, p. 93 (♀); O. Sacken, Proct. Bost. Soc. N. H. 1875. Northern and Middle States (probably also in Europe).

Epistrophe conjungens Walker, Dipt. Saunders, p. 242; Tab. VI, fig. 5 (♂).

*rectus *O. Sacken*, Proc. Bost. Soc. N. H. 1875. Northern and Middle States (common).

Syrphus ribesii, Linné et auctores. Europe.

sexquadratus *Walker*, List, etc., III, p. 586. Huds. B. Terr.; Nova Scotia.

tarsatus *Zetterstedt*, etc.; Staeger, Groenl. Antliater, p. 360, 27. Europe and Greenland.

*torvus *O. Sacken*, Proc. Bost. Soc Nat. Hist. 1875; United States (common).

Syrphus topiarius Zetterstedt (non Meigen); Staeger, Groenl. Antl. p. 360, 26. [Synonymy confirmed by Mr. Verrall in litt.] Europe; Greenland.

*umbellatarum *O. Sacken*, Proc. Bost. Soc. N. H. 1875. White Mts., N. H. (?)

? Syrphus umbellatarum Schiner, Fauna Austr. I, p. 307. Europe.

? Syrphus guttatus in Walker's List, etc., III, p. 586. Huds. B. Terr.

OBSERVATION.—The following two species are either *S. torvus* or *S. rectus*; their descriptions, however, are too short for identification (compare O. Sacken, Proc. Bost. Soc. N. H. 1875).

Scaeva concava *Say*, Journ. Acad. Phil. III, p. 89, 3; Wiedemann, Auss. Zw. II, p. 130, 24 (*Syrphus*).

Syrphus philadelphicus *Macquart*, Dipt. Exot. II, 2, p. 93; Tab. XVI, 2. Philadelphia.

fumipennis *Thomson*, Eugen. Resa., etc., p. 499. California.

infumatus *Thomson*, ibid., p. 501. California.

limbiventris *Thomson*, ibid., p 495. California.

sulphuripes *Thomson*, ibid., p. 500. California.

trichopus *Thomson*, ibid., 502. California. [The M. C. Z. has specimens of a Syrphus from San Francisco, which I cannot distinguish from the European *S. pyrastri*.]

Antipathes *Walker*, List, etc., III, p 589. Jamaica.

colludens *Walker*, Trans. Entom. Soc. N. Ser. V, p. . Mexico.

delineatus *Macquart*, Dipt. Exot. 1er Suppl. p. 139, 37; Tab. XI, fig. 13. Mexico.

***jaetator** *Loew*, Wiener Ent. Mon. V, p. 40; Centur. VI, 46. Cuba.

limbatus *Fabricius*, Syst. Antl. p. 251, 10 (*Scaeva*); Wiedemann, Auss. Zw. II, 133, 30. West Indies.

mutuus *Say*, J. Acad. Phil. VI, p. 164, 2. Mexico.

***nigripes** *Loew*, Centur. VI, 44. Cuba.

***praeustus** *Loew*, Centur. VI, 44. Cuba.

quadrifasciatus *Bigot*, in R. de la Sagra, etc., p. 804; Tab. 20, fig. 5. Cuba.

radiatus *Bigot*, in R. de la Sagra, etc., 804. Cuba.

***simplex** *Loew*, Wien. Ent. Mon. V, p. 40; Centur. VI, 43. Cuba.

stegnus *Say*, J. Acad. Phil. VI, p. 163, 1. Mexico.

OBSERVATION.—The following species, described as *Syrphus*, belongs to some other genus; I am unable to say what.

sexmaculatus *Palisot*, Beauvois, Ins. p. 224; Dipt. Tab. III, fig. 8. Southern States; San Domingo.

DIDEA.

Macquart, Hist. Nat. Dipt. I, p. 508, 1834. *Enica* Meigen.

*fuscipes *Loew*, (8) Centur. IV, 82. Pennsylvania.

*laxa n. sp., see in the Appendix. White Mts., N. H.; Lake Superior.

MESOGRAPTA.

Loew, Centur. Vol. II, p. 210; *Messogramma* Loew, Centur. VI, 47, 1865.

*Boscii *Macquart*, Dipt. Exot. II, 2, p. 100, 23; Tab. XVII, fig. 2 (*Syrphus*). Carolina.

*coalescens *Walker*, Dipt. Saund. p. 237 (*Syrphus*). North America (*Mesograpta*—Verrall in litt.).

*Corbis *Walker*, Dipt. Saund. p. 235 (*Syrphus.*) North America (*Mesograpta*—Verrall in litt.).

dimensus *Walker*, Dipt. Saund. p. 235 (*Syrphus*). North America (*Mesograpta*—Verrall in litt.).

*geminata *Say*, J. Acad. Phil. III, p. 92, 7 (*Scaeva*); Wiedemann, Auss. Zw. II, p. 145, 50 (*Syrphus*). United States (common).

Toxomerus notatus Macquart, Dipt. Exot. 5e Suppl. p. 93.

Gurges *Walker*, Dipt. Saund. p. 236 (*Syrphus*). North America (*Mesograpta*—Verrall in litt.).

interrogans *Walker*, Dipt. Saund. p. 238 (*Syrphus*). North America.

*marginata *Say*, J. Acad. Phil. III, p. 92, 6 (*Scaeva*); Wiedemann, Auss. Zw. II, p. 146, 52 (*Syrphus*). United States (common).

*polita *Say*, J. Acad. Phil. III, p. 88, 1 (*Scaeva*); *id.*, American Entomology, I, Tab. XI (*Syrphus*); Wiedemann, Auss. Zw. II, p. 132, 28 (*id.*). Pennsylvania; District Columbia; also in Cuba.

Syrphus cingulatulus Macquart, Dipt. Exot. 4e Suppl. p. 155, 53.
Syrphus hecticus Jaennicke, Neue Exot. Dipt. p. 90. Illinois.

*parvula *Loew*, Centur. VI, 47. Florida.
*planiventris *Loew*, Centur. VI, 49. Florida.
Quintius *Walker*, Dipt. Saund. p. 239 (*Syrphus*). United States.

---

anchorata *Macquart*, Dipt. Exot. II, 2, p. 97; Tab. 16, fig. 8 (*Syrphus*). Brazil; N. America.

*arcifera *Loew*, Centur. VI, 52. Cuba.

ectypus *Say*, J. Ac. Phil. VI, p. 165, 3 (*Syrphus*). Cuba.

*laciniosa *Loew*, Centur. VI, 50. Cuba.

minuta *Wiedemann*, Auss. Zw. II, p. 146 (*Syrphus*) ; Bigot, in R. de la Sagra, etc., p. 806. Brazil (Wied.); Cuba (Bigot).

***poecilogastra** *Loew*, Centur. VI, 51. Cuba.

pulchella *Macquart*, Dipt. Exot. 1er Suppl. p. 138, 36; Tab. XI, fig. 12 (*Syrphus*). San Domingo.

***subannulata** *Loew*, Centur. VI, 48. Cuba.

SPHAEROPHORIA.(9)

St. Fargeau et Serville, Encyl. Méthod. X, p. 513, 1825 ; Macquart, Dipt. du Nord. M., 1829; *Melithreptus* Loew, Oken's Isis 1840, p. 573.

***cylindrica** *Say*, Amer. Entom. I; Tab. XI (*Syrphus*); Wiedemann, Auss. Zw. II, p. 138, 38 (*id.*). North America (common).

Sphaerophoria contigua Macquart, Dipt. Exot. 2e Suppl. p. 62, 4.

strigata *Stäger*, Groenl. Antl. p. 362, 31. Greenland.

Observation.—Mr. Walker mentions the European *S. hieroglyphica, menthastri* and *scripta* as occurring in Nova Scotia (Walker, List, etc., III, p. 593).

ALLOGRAPTA.(10)

Nov. gen.

?**emarginata** *Say*, J. Ac. Phil. III, p. 91, 5 (*Scaeva*); Wiedemann, Auss. Zw. II, p. 119, 4 (*Syrphus*). Florida (Say); Virginia; Delaware (Ent. Soc. Phil.).

***obliqua** *Say*, J. Acad. Phil. III, p. 89, 2 (*Scaeva*); Amer. Entomologist, I; Tab. VIII; Wiedeman, Auss. Zw. II, p. 138, 39. North America; also in South America (Schiner, Dipt. Novara, etc., p. 353).

Syrphus securiferus Macquart, Dipt. Exot. II, 2, p. 100, 22 and 1er Suppl. p. 139 (♀).

Sphaerophoria Bacchides Walker, List, etc., III, p. 594.

Syrphus signatus, v. d. Wulp, Tijdschr. v. Ent. 2e Ser. II, p. 144 ; Tab. IV, fig. 12.

XANTHOGRAMMA.

Schiner, Wien. Ent. Mon. IV, p. 215, 1860.

***felix** n. sp., see in the Appendix. West Point, N. Y.; Pennsylvania; Illinois.

DOROS.

Meigen, Illig. Mag. II, 1803.

***aequalis** *Loew*, Centur. IV, 34 (Pennsylvania).

***Balyras** *Walker*, List, etc., III, p. 577. New York; White Mts., N. H. (this species can hardly be called a *Doros*).

***flavipes** *Loew*, Centur. IV, 33. Pennsylvania (Lw.); New York.

ASCIA.

Meigen, Syst. Beschr. III, p. 193, 1822.

*globosa *Walker*, List, etc., III, p. 546. Trenton Falls, N. Y.

SPHEGINA.

Meigen, Syst. Beschr. III, p. 193, 1822.

*infuscata *Loew*, Centur. III, 23. Sitka.

*lobata *Loew*, Centur. III, 21. Northern and Middle States; Canada.

*ruflventris *Loew*, Centur. III, 21. New York; White Mts., N. H.; Canada.

OCYPTAMUS.

Macquart, Hist. Nat. Dipt. I, p. 554; Tab, XII, fig. 13, 1834; compare also Loew, Dipt. Südafrico's, p. 293.

*fuscipennis *Say*, J. Acad. Phil. III, p. 100 (*Baccha*). United States.
Ocyptamus fascipennis Macquart, Hist. Nat. Dipt. I, p. 554, 2; Tab. 12, fig. 13.
Syrphus Amissas Walker, List, etc., III, p. 589.

*longiventris *Loew*, Centur. VII, 66. Distr. Columbia.

Radaca *Walker*, List, etc., III, p. 590 (*Syrphus*). Florida.

---

*conformis *Loew*, Centur. VII, 67. Cuba.

dimidiatus *Fabricius*, Ent. Syst. IV, p. 310, 118 (*Syrphus*); Syst. Antl. p. 254 25 (*Scaeva*); Wiedeman, Auss. Zw. II, p. 140, 42. West Indies (*Ocypta mus*—Verrall in litt.).

funebris *Macquart*, Dipt. Exot. II, 2, p. 105; Bigot, in Ramon de la Sagra, etc., p. 807. Teneriffa, but more probably America "(Macq.); Cuba" (Bigot).

*latiusculus *Loew*, Centur. VII, 68. Cuba.

*scutellatus *Loew*, Centur. VII, 69. Cuba.

BACCHA. (*)

Fabricius, Syst. Antl. p. 199, 1805.

*aurinota (*Harris*) Walker, List, etc., III, p. 548. United States (Massachu setts; White Mts.; New York, etc.).
? Baccha fascipennis Wiedemann, List, etc., III, p. 96. No locality given.

Babista *Walker*, List, etc., III, p. 549. Georgia.

*cognata *Loew*, Centur. III, 27. Northern Wisconsin.

(*) Some of the species put in this genus may belong to *Ocyptamus*.

costata *Say*, Journ. Acad. Phil. VI, p. 161. Indiana.

***lugens** *Loew*, Centur. III, 24. Northern Wisconsin.

lineata *Macquart*, Dipt. Exot. 1er Suppl. p. 139, 4; Tab. XX, fig. 5. Texas; Yucatan.

***obscuricornis** *Loew*, Centur. III, 26. Sitka.

Tarchetius *Walker*, List, etc., III, p. 549. Georgia.

***capitata** *Loew*, Centur. III, 25. Cuba.

clavata *Fabricius*, Entomol. Systematica IV, p. 298, 73 (*Syrphus*); Syst Antl. p. 200, 3, (*id.*). West Indies.

cochenillivora *Guérin*, Rev. Zool. 1848, p. 350. Mexico.

cubensis *Macquart*, Dipt. Exot. 4e Suppl. p. 161, 5. Cuba.

cylindrica *Fabricius*, Spec. Ins. II, p. 429, 41 (*Syrphus*); Entom. Syst. IV, p. 298, 74 (*id.*); Syst. Antl. p. 199, 2; Wiedeman, Auss. Zw. II, p. 92. West Indies.

***notata** *Loew*, Centur. VII, 65. Cuba.

***parvicornis** *Loew*, Wiener, Ent. Monatschr. V, p. 41; Centur. VII, 64. Cuba.

MYIOLEPTA.

Newman, Entom. Mag. V, p. 373, 1838.

***aerea** *Loew*, Centur. X, 53. Illinois.

***nigra** *Loew*, Centur. X, 52. Pennsylvania.

***strigilata** *Loew*, Centur. X, 54. Texas.

***varipes** *Loew*, Centur. IX, 79. Virginia.

RHINGIA.

Scopoli, Entom. Carnivl. p. 353, 1763.

***nasica** *Say*, J. Acad. Phil. III, p. 94; Wiedemann, Auss. Zw. II, p. 115, 1. United States.

BRACHYOPA.

Meigen, Syst. Beschr. III, p. 260, 1822.

***notata** n. sp., see in the Appendix. White Mts., N. H.

***vacua** n. sp., see in the Appendix. Quebec, Canada.

VOLUCELLA.

Geoffroy, Hist. des Ins. II, 1764; *Cenogaster* Duméril, Dict. d'Hist. Nat. (Levrault in Strasburg, publisher), 1817.

***esuriens** *Fabricius*, Ent. Syst. IV, p. 281, 10 (*Syrphus*); Syst. Antl. p. 226, 9 (*id.*); Wiedemann, Auss. Zw. II, p. 197, 4. West Indies (Fabr.); Texas, also in South America (Schiner, Novara).

Volucella mexicana Macquart, Dipt. Exot. II, 2, p. 25, 10; Tab. V, fig. 3. Mexico.

***evecta** *Walker*, Dipt. Saund. p. 251. Brit. Possessions and United States (White Mts., N. H.; Massachusetts; Detroit, Mich.).

Volucella plumata, Macquart (non Fabr.); Dipt. Exot. 4e Suppl. p. 131.

***fasciata** *Macquart*, Dipt. Exot. II, p. 22, 2; Tab. V, fig. 2. Carolina (Macq.) Florida.

Volucella pusilla Macquart, Dipt. Exot. II, 2, p. 21, 1; Tab. V, fig. 1 ("perhaps variety of *V. fasciata*" Macq.). Cuba.

vacua *Fabricius*, Syst. Ent. p. 764, 4 (*Syrpus*); Ent. Syst. IV, p. 281, 114 (*id.*) Syst. Antl. p. 227, 13 (*id.*); Wiedeman, Auss. Zw. II, p. 201, 13. South America (Fab.). Florida; Georgia (Walk.).

***vesiculosa**(1) *Fabricius*, Syst. Antl. p. 226, 11 (*Syrphus*); Wiedemann, Auss. Zw. II, p. 201, 11; Macquart, Dipt. Exot. 3e Suppl. p. 39; Tab. IV, fig. 3. North America; Pennsylvania; Maryland; Kentucky; South America (Wied.).

---

abdominalis *Wiedemann*, Auss. Zw. II, p. 196, 2; Macquart, Dipt. Exot. II, 2, p. 25, 8. Cuba.

aperta *Walker*, Trans. Ent. Soc. N. Ser. V, p. 292. Mexico.

apicalis *Loew*, Centur. VI, 36. Cuba.

chalybescens *Wiedemann*, Auss. Zw. II, p. 204. Brazil (Wied.); Cuba (Jaennicke, l. c. p. 4).

Haagii *Jaennicke*, Neue Exot. Dipt. p. 89. Mexico.

lata *Wiedemann*, Auss. Zw. II, p. 195. Mexico.

? **marginata** *Say*, J. Acad. Phil. VI, p. 166, 1. Mexico.

Maximiliani *Jaennicke*, Neue Exot. Dipt. p. 87. Mexico.

[Brauer in his *Entomol. Bericht für* 1868, says that this is a synonym of *Volucella americana* Wiedemann. But I find no such *Volucella* described.]

metallifera *Walker*, List, etc., III, p. 636. Mexico; Venezuela.

mellea *Jaennicke*, Neue Exot. Dipt. p. 88. Mexico.

*obesa *Fabricius*, Syst. Ent. p. 763, 5 (*Syrphus*); Ent. Syst. IV, p. 282 (*id.*); Syst. Antl. p. 227 (*id.*); Wiedemann, Auss. Zw. II, p. 199; Macquart, Hist. Nat. Dipt. I, p. 494, 5; St. Fargeau et Serville, Encyclop. Méthod. X, p. 786 (*Orindia*). In the tropics everywhere; West Indies; South America; Asia; Africa.

picta *Wiedemann*, Auss. Zw. II, p. 201; Bigot, in R. de la Sagra, etc., p. 802. Brazil (Wied.); Cuba (Bigot).

postica *Say*, J. Acad. Phil. VI, p. 166, 2. Mexico.

*sexpunctata *Loew*, Wien. Entom. Monatschr. V, p. 39; Centur. VI, 37. Cuba.

tibialis *Macquart*, Dipt. Exot. 1er Suppl. p. 123, 4. Yucatan.

? **violacea** *Say*, J. Acad. Phil. VI, p. 166, 1. Mexico.

TEMNOCERA.

St. Farġeau et Serville, Encycl. Méthod. X, p. 786, 1825.

*megacephala *Loew*, Centur. IV, 57. California.

---

*pubescens *Loew*, Wien. Ent. Mon. V, p. 38; id. Centur. VI, 35. Cuba.

*purpurascens *Loew*, Centur. VIII, 52. Hayti.

unilecta *Walker*, Trans. Ent. Soc. N. Ser. V, p. 292. Mexico.

viridula *Walker*, Trans. Ent. Soc. N. Ser. V, p. 292. Mexico.

SERICOMYIA.

Meigen, in Illig. Mag. II, 1803.

*chalcopyga *Loew*, Centur. III, 20. Sitka.

*limbipennis *Macquart*, Dipt. Exot. 2e Suppl. p. 58, 2 (♀). United States and Canada.

Sericomyia chrysotoxoides, Macquart, Dipt. Exot. II, 2, p. 19, 1; Tab. III, fig. 3 *bis.* (♂).

Sericomyia filia Walker, List, etc., III, p. 596.

*militaris *Walker*, List, etc., III, p. 595. Huds. B. Terr.; Nova Scotia; White Mts., N. H.; Colorado Mts.; Red River of the North.

sexfasciata *Walker*, List, etc., III, p. 596. Huds. B. Terr.

Observation.—*Volucella lappona* O. Fabricius, Fauna Groenl. p. 208, 169, must be a *Sericomyia;* whether it is *Seric. lappona* Linn. I do not know; Schiödte omits it in his enumeration.

ARCTOPHILA.

Schiner, Wien. Entom. Mon. IV, p. 215, 1860

*flagrans n. sp., see in the Appendix. Colorado Mts.

PTEROPTILA.

Loew, Centur. VI, 59, 1865.

*decora *Loew*, Centur. VI, 59. Cuba.
zonata *Loew*, Centur. VI, 60. Mexico.

ERISTALIS.

Latreille, Hist. Nat. des Crust. et des Ins. XIV, p. 363, 1804.

acutus *Fabricius*, Syst. Antl. p. 189, 7 (*Milesia*); Wiedemann, Auss. Zw. II, p. 110, 8 (id.). Carolina (Wiedemann, l. c. p. 104, says that this species is an *Eristalis*).

*aeneus *Scopoli*, Fabricius, Meigen (Syst. Beschr. etc. III, p. 384, 2). Europe and North America (common).

Eristalis sincerus Harris, Ins. Injur. to Veget. 3d edt. p. 609. [The identity with the European species is acknowledged by Loew, in Sillim Journ., Vol. XXXVII, p. 317.]

Eristalis cuprovittatus Wiedemann, Auss. Zw. II, p. 190, 54.

albiceps *Macquart*, Dipt. Exot. II, 2, p. 56, 41. Carolina.

*atriceps *Loew*, Centur. VI, 64. White Mountains, N. H.; Canada.

*Androclus *Walker*, List etc., III, p. 618. British Possessions (Walk.); Quebec; Western New York; White Mountains, N. H.

? Eristalis Walker, List, etc., III, p. 614.

? Eristalis dimidiatus Walker (non Wiedem.), List, etc., III, p. 618.

basilaris *Macquart*, Hist. Nat. Dipt. I, p. 502, 4. North America.

*Bastardi *Macquart*, Dipt. Exot. II, 2, p. 35, 7; Tab. IX, fig. 1. North America (common everywhere; as far North as Fort Resolution; Hud. B. Terr.).

chalepus *Walker*, Dipt. Saund. III, p. 247. Canada.

compactus *Walker*, List, etc., III, p. 619. Hudson Bay Territory.

*dimidiatus *Wiedemann*, Auss. Zw., II, p. 180, 41. North America (common).

Eristalis incisuralis Macquart, Dipt. Exot. 4e Suppl., p. 139, 64 (♀).

Eristalis Herminieri Macquart, Dipt. Exot. II, 2, p. 55, 38 ("var. of *E. similis?*") (♂).

niger Macquart, Hist. Nat. Dipt. I, p. 505, 15.

everes *Walker*, Dipt. Saund. III, p. 246. North America.

*flavipes *Walker*, (11) List, etc., III, p. 633. British Possessions; White Mountains, N. H.; Massachusetts; Newport, R. I.; Detroit, Mich.

Milesia Carda Say (♀), Journ. Acad. Phil. VI, p. 163.

inflatus *Macquart*, Hist. Nat. Dipt. I, p. 507, 18. North America.

*inornatus *Loew*, Centur. VI, 68. Red River of the North (Loew).

intersistens *Walker*, List, etc., III, p. 615. Trenton Falls, N. Y.

*latifrons *Loew*, Centur. VI, 65. Matamoras.

*melanostomus *Loew*, Centur. VI, 69. British Possessions; Oregon; Minnesota; Massachusetts; Illinois.

Eristalis flavipes Walker, List, etc., III, p. 633; Var. B [Synonymy of Loew].

*obscurus *Loew*, Centur. VI, 67. North Red River.

*pilosus *Loew*, Centur. VI, 70. Greenland.

pervagus (*Harris*), Walker, List, etc., III, p. 618, Massachusetts.

porcus *Walker*, see Eumerus.

pumilus *Macquart*, Dipt. Exot. III, 2, p. 57, 43. North America.

*saxorum *Wiedemann*, Auss. Zw. III, p. 158, 9; Macquart, Dipt. Exot. II, 2, p. 33, 5. Savannah (Wied.); Philadelphia (Macq.); Massachusetts (M. C. Z.)

Eristalis chalybeus, Macquart, Dipt. Exot. II, 2, p. 55, 39.

semimetallicus *Macquart*, Dipt. Exot. 4e Suppl., p. 140, 65. Nova Scotia; Canada.

*tenax *Linné*, etc. Europe; North America. (I took on my window in Cambridge, Mass., Nov. 6th, 1875, a female specimen, which does not seem to differ from the European *E. tenax*, and to which I leave this name, until a more thorough comparison can be made.)

*transversus *Wiedemann*, Auss. Zw. II, p. 188, 51; Macquart. Dipt. Exot. II, 2, p. 33, 4; Tab. IX, fig. 12. United States (common).

? Eristalis philadelphicus Macquart, Dipt. Exot. II, 2, p. 34, 6; Tab. VIII, fig. 4.

trifasciatus *Lay*, (12) Journ. Acad. Phil. VI, p. 165. Indiana. [The new edition of Jay's Entom. writings erroneously has Mexico.]

*vinetorum *Fabricius*) Syst. Antl. p. 235, 13; Entom. Syst. Suppl. p. 562, 27; Wiedemann, Auss. Zw. II, p, 163, 15; Macquart, Dipt. Exot. II, 2, p. 41, 16. Cuba (Fabr.); Brazil (Schiner, Novara, p. 361); Pennsylvania (Carlisle Springs, in August, 1860; O. S.); Florida; Matamoras.

vittatus *Macquart*, Hist. Nat. Dipt. I, p. 507, 19 (description agrees with *E. transversus*, except that the eyes are said to be glabrous). North America.

*hirtus *Loew*, Centur. VI, 66. California.

temporalis *Thomson*, Eug. Resa, etc., p. 490. California.

*atrimanus *Loew*, Centur. VI, 62. Cuba.

Bellardii *Jaennicke*, Neue Exot. Dipt. p. 92. Mexico.

cubensis *Macquart*, Dipt. Exot. II, 2, p. 49, 19 (" ♀ of *albifrons* or variety of *annulipes* Macq.?" Macquart). Cuba.

diminutus *Walker*, List, etc., III, p. 622. Mexico.

expictus *Walker*, Trans. Ent. Soc. N. Ser. V, p. 291. Mexico.

familiaris *Walker*, Trans. Ent. Sec. N. Ser. V, p. 290. Mexico.

femoratus *Macquart*, Dipt. Exot. II, 2, p. 40, 15; Tab. IX, fig. 6; also 1er Suppl. p. 130, Tab. IX, fig. 6. Rio Janeiro; Columbia, S. A.; Yucatan. [Syn. of *E. furcatus* Wiedemann, Auss. Zw. II, p. 176, 34; Brazil and Montevideo. Verrall in litt.]

guadalupensis *Macquart*, Dipt. Exot. II, 2, p. 32, 3. Guadeloupe.

*Gundlachi *Loew*, Centur. VI, 61. Cuba.

*hortorum *Fabricius*, Syst. Ent. p. 764, 11; Entom. Syst. IV, p. 285, 29 (*Syrphus*); Syst. Antl. p. 236, 16; Wiedemann, Auss Zw. II, p. 169, 24. West Indies. *Musca surinamensis* Degeer, VI, p. 141; Tab. XXIX, fig. 1.

impositus *Walker*, Trans. Ent. Soc. N. Ser. V, p. 289. Haity.

lateralis *Walker*, Linn. Trans. XVII, p. 347, 42. Brazil; Chili; Guyana; Mexico; Jamaica (Walker, List, etc., III, p. 622.)

mexicanus *Macquart*, Dipt. Exot. 2e Suppl. p. 59, 54. Mexico.

pinguis *Fabricius*, Syst. Ent. p. 763, 6; Ent. Syst. IV, p. 282, 16 (*Syrphus*); Syst. Antl. p. 233, 6; Wiedemann, Auss. Zw. II, p. 193, 61. Jamaica.

Musca cincta Drury, Ins. I, p. 109, Tab. XLV, fig. 6.

semicirculus *Walker*, Dipt. Saund. p. 249. Honduras.

*seniculus *Loew*, Centur. VI, 63. Cuba.

testaceicornis *Macquart*, Dipt. Exot. 4e Suppl. p. 138, 62. Mexico.

thoracicus *Jaennicke*, Neue Exot. Dipt. p. 91. Mexico.

tricolor *Jaennicke*, Neue Exot. Dipt. p. 92. Mexico.

uvarum *Walker*, List, etc., III, p. 623. Jamaica.

PLAGIOCERA.

Macquart, Dipt. Exot. II, 2, p. 59, 1842.

*crucigera *Wiedemann*, Auss. Zw. II, p. 105, 2; Macquart, Dipt. Exot. II, 2, p. 60, 1; Tab. X, fig. 7; also 1er Suppl. p. 134. Florida; Georgia; Dallas, Texas.

Mallota milesiformis Macquart, Hist. Nat. Dipt. I, p. 500 [Synonymy by Macquart].

Ania *Walker*, List, etc., III, p. 564 (*Milesia*); Macquart, Dipt. Exot. 5e Suppl. p. 94, 9. Jamaica.

pratorum *Fabricius*, Syst. Ent. p. 765, 13; Ent. Syst. IV, p. 286, 31 (*Syrphus*); Syst. Antl. p. 236, 18 (*Eristalis*). West Indies. (*Plagiocera*. Verrall in litt.).

***ruficrus** *Wiedemann*, Auss. Zw. II, p. 165, 3. *Milesia*. Cuba.

HELOPHILUS. (13)

Meigen, in Illiger's Magaz. II, 1803.

***chrysostomus** *Wiedemann*, Auss. Zw. II, p. 174 (*Eristalis*). Savannah (Wied.); New York; White Mts., N. H.

borealis *Staeger*, Groenl. Antl. p. 359, 25; Loew, Stett. Ent. Zeit. VII, p. 123. Greenland.

***divisus** *Loew*, Centur. IV, 78. Dist. Columbia.

***glacialis** *Loew*, Stett. Ent. Zeitschr. VII, p. 121. Labrador.

***groenlandicus** *O. Fabricius*, Fauna Groenl. p. 208, 170 (*Tabanus*); Loew, Stett. Ent. Z. VII, p. 119. Arctic America; Greenland; Twin Lakes (Colorado); Labrador.

Helophilus arcticus Zetterstedt, Ins. Lapp. p. 595, 2; Dipt. Scand. II, p. 678, 2; Stäger, Kröjer's Tidskr. N. R. I, p. 359. [Synon. by Loew and Schiödte].

Helophilus bilineatus Curtis, Ins. of Ross's Exp. p. LXXVIII [Synon. by Schiödte, Berl. Ent. Z. 1859, p. 153].

? Helophilus latro Walker, List, etc., III, p. 607. Huds. B. Territ.; Nova Scotia.

***hamatus** *Loew*, Centur. IV, 79. Fort Resolution, H. B. Terr.

***integer** *Loew*, Centur. IV, 76. New York.

***laetus** *Loew*, Centur. IV, 77. New York; Northern Wisconsin.

***latifrons** *Loew*, Centur. IV, 73. Northern States; Nebraska.

***lineatus** *Fabricius*, Meijen. Curtis (Brit. Ent.) etc., Loew, Stett. Ent. Z. 1846, p. 167. Europe; North America (Massachusetts; Illinois; Quebec, Can.).

Novae Scotiae *Macquart*, Dipt. Exot. 2e Suppl. p. 60. Nova Scotia.

***obscurus** *Loew*, (14) Centur. IV, 74. Carolina (Lw.); Fort Resolution, H. B. Terr.; South Park, Colorado.

***obsoletus** *Loew*, Centur. IV, 75. Fort Resolution, H. B. T.

***similis** *Macquart*, Dipt. Exot. II, 2, p. 64, 7. Georgia (Macq.); United States; Canada.

Helophilus fasciatus Walker, List, etc., III, p. 605. Trenton Falls.

Eristalis decisus (15) Walker, List, etc., III, p. 604. Trenton Falls.

Helophilus susurrans (16) Jaennicke, Neue Exot. Dipt. p. 94. Illinois.

*polygrammus *Loew*, Centur. X, 55. California.

femoralis *Walker*, List, etc., III, p. 603. Mexico.

mexicanus *Macquart*, Dipt. Exot. II, 2, p. 61, 6; Tab. XI, fig. 2. Mexico.

Observation.—*Helophilus Anausis* Walker, List, etc., III, p. 603 (Huds. B. Terr.); *Helophilus stipatus* Walker, List, etc., III, p. 602 (Trenton Falls), are identical either with *H. lineatus* or with *hamatus* Loew.

About the occurrence of the European *Heloph. pendulus, versicolor* and *florea* in N. America, see *ante*, at the end of *Chrysotoxum*.

TEUCHOCNEMIS. (17)

N. gen.

*Bacuntius *Walker*, (18) List, etc., III, p. 563 (*Milesia*). Georgia; Texas.

*lituratus *Loew*, Centur. IV, 80 (*Pterallastes*). Pennsylvania.

PTERALLASTES.

Loew, Centur. IV, 80, 1863.

*thoracicus *Loew*, Centur. IV, 80. Pennsylvania.

MALLOTA.

Meigen, Syst. Beschr. III, p. 377, 1822; *Imatisma* Macquart, Dipt. Exot. II, 2, p. 67.

*posticata *Fabricius*, Syst. Antl. p. 237, 21 (*Eristalis*); Wiedemann, Auss. Zw. II, p. 194, 62 (*Merodon?*); Macquart, Dipt. Exot. II, 2, p. 68; Tab. XII, fig. 2 (*Imatisma*). United States.

Syrphus cimbiciformis Fallen, *Eristalis cimbiciformis* Meigen. The north of Europe (the identity of this species with the N. American one is acknowledged by Mr. Loew in Neue Beiträge, IV, p. 18 and later, in Sillim. Journ. Vol. XXXVII, p. 317).

? Merodon Bautias Walker, List, etc. III, p. 600.

*barda *Say*, Journ. Acad. Phil. VI, p. 163 (*Milesia*) *male;* (the female, described by Say is that of *Eristalis flavipes* Walker; compare note H.) Catskill, N. Y.; Massachusetts; White Mts., N. H

MERODON.

Meigen, Illig. Magaz. II, 1803.

Balanus *Walker*, List, etc., III, p. 600. New York.

bipartitus *Walker*, List, etc., III, p. 599. Georgia.

POLYDONTA.

Macquart, Dipt. Exot. 4e Suppl. p. 144.

*curvipes *Wiedemann*, Auss. Zw. II, p. 149, 3 (*Merodon*). Northern States and British Possessions.

Polydonta bicolor Macquart, Dipt. Exot. 4e Suppl. p. 144, 1; Tab. XIII, fig. 6 (*male*).

Helophilus albiceps Macquart, Dipt. Exot. 1er Suppl. p. 132, 9; Tab. XI, fig, 7 (*female*).

Merodon morosus Walker, List, etc., III, p. 599 (*female*).

TROPIDIA.

Meigen, Syst. Beschr. III, p. 346, 1822.

albistylum *Macquart*, Dipt. Exot. 2e Suppl, p. 60, I; Tab. II, fig. 10. North Amarica.

*mamillata *Loew*, Centur. I, 68. Illinois.

*quadrata *Say*, Amer. Entom. I, Tab. VIII (*Xylota*); Wiedemann, Auss. Zw. II, p. 101, 6 (*id.*); Macquart, Dipt. Exot. II, p. 272. United States (Massachusetts, White Mts., N. H.; New York).

CRIORRHINA.

Criorhina Hoffmannsegge (*in litt.*), was introdced as a subgenus *Milesia* in Meigen, Syst. Beschr. III, p. 236, 1822; appears as such in St. Fargeau et Serville, Encycl. Method. X, p. 518, 1825; adopted as a genus in Macquart, Hist. Nat. Dipt. I, p. 497, 1834.

*analis *Macquart*, Dist. Exot. II, 2, p. 79, Tab. XV, fig. 2 (*Milesia*). North America (Macq.)

*armillata n. sp. See in the Appendix. Quebec, Canada.

BRACHYPALPUS.

Macquart, Hist. Nat. Dipt. I, p. 523, 1834.

*cyanogaster *Loew*, Centur. X, 51. Pennsylvania.

*frontosus *Loew*, Centur. X, 50. Distr. Columbia; Texas; Massachusetts.

*verbosus (*Harris*) Walker, List, etc. III, p. 568. Connecticut; Canada; Virginia.

Musca tomentosa Swederus, Vetensk. Ac. Nya. Handl., 1787.

XYLOTA.

Meigen, Syst. Beschr. III, p. 211; 1822.

Aepalius *Walker*, List, etc., III, p. 557. Georgia.

Anthreas *Walker* List, etc., III, p. 556. Trenton Falls, N. Y.

*angustiventris *Loew*, Centur. VI, 53. Illinois; Western New York.

*badia *Walker*, List, etc., III, p. 559. New York (Wk.); White Mts., N. H.; Maine.

Baton *Walker*, List, etc., III, p. 554 (" perhaps synon. with *cjuncida*" Wk.). Florida; Nova Scotia

*barbata *Loew*, Cantur. V, 40. Sitka.

*bicolor *Loew*, Centur. V, 39. Illinois (Lw.); Englewood, N. J.

*chalybea *Wiedemann*, Auss. Zw. II, p. 98. No locality (Wied.); Northern and Middle States (Illinois; Pennsylvania).

communis *Walker*, List, etc., III. p. 557. Huds. B. Terr.

curvipes *Loew*, Neue Beitr., II, p. 19, 41. Europe and North America; White Mts., N. H. (About the identity of the species, see No. 9 in the Appendix.)

*cjuncida *Say* ([19]), Amer. Entom. I, Tab. VIII; Wiedemann, Auss. Zw. II, p. 100, 5. Florida; Pennsylvania (Say); New England (common).

flavifrons *Walker*, List, etc., III, p. 537. Huds. B. Terr.

*fraudulosa *Loew*, Centur. V, 41. Illinois, Wisconsin, White Mountains.

*pigra *Fabricius*, Meigen, etc. Europe and North America. Xylota haematodes Fabricius, Syst. Antl., p. 193, 21 (*Milesia*); Say, Amer. Entom. I, Tab. VIII; Wiedemann, Auss. Zw. II, p. 99, 3; Macquart, Dipt. Exot. II, 2, p. 73; Tab. XIII, fig. 4. North America. [About the specific identity, see Loew, Sillim. Journ. Vol. XXXVII, p. 317.]

Libo *Walker*, List, etc., III, p. 556. Nova Scotia.

metallica *Wiedemann*, Auss. Sw. II, p. 162, 8. Georgia.

Oarus *Walker*, List, etc., III, p. 558. Trenton Falls, N. Y.

*obscura *Loew*, Centur. VI, 55. Red River of the North.

*quadrimaculata *Loew*, Centur. VI, 56. Illinois.

*subfaciata *Loew*, Centur. VI, 57. Red River of the North.

*vecors n. sp., see No. 8 in the Appendix. White Mts., N. H.

---

arcuata *Say*, J. Acad. Phil. VI, p. 162. Mexico.

*pachymera *Loew*, Centur. VI, 54. Cuba.

*pretiosa *Loew*, Wien. Entom. Monatschr. V, p. 39; Centur. VI, 53. Cuba.

subcostalis *Walker*, Trans. Ent. Soc. Phil., N. S. V, p. 291. Mexico.

SYRITTA.

St. Fargeau et Serville, Encycl. Méthod. X, p. 808; 1825.

*pipiens *Linné*, Meigen, etc. Europe and North America (common).

Xylota proxima Say, Amer. Entomology I, Tab. VIII; Wiedemann, Auss. Zw. II. p. 102, 9. (About the identity of the European and N. American species, compare Loew, Sillim. Journ. l. c.)

EUMERUS.[20]

Meigen, Syst. Beschr. III, p. 202, 1822.

porcus *Walker*, List, etc., III, p. 551. Huds. B. Terr.
[Is an *Eristalis*—Verral in litt.]

privernus *Walker*, Dipt. Saund., p. 225. United States.

CHRYSOCHLAMYS.[21]

Walker (Rondani), Ins. Brit. I, p. 279, 1851.

*__buccata__ *Loew*, Centur. IV, 72. Virginia.

SPILOMYIA.[22]

Meigen, in Illiger's Magazine, II, 1803.

*__fusca__ *Loew*, Centur. V, 34. Pennsylvania, Massachusetts, White Mts., N. H.

*__hamifera__ *Loew*, Centur. V, 35. Pennsylvania; Virginia; Florida.

*__longicornis__ *Loew*, Centur. X, 49. Massachusetts; Pennsylvania; Texas.

TEMNOSTOMA.

St. Fargeau et Serville, Encycl. Méth. X, p. 518, 1825.

*__aequalis__ *Loew*,[23] Centur. V, 36. British North America; New England (White Mountains, N. H., not rare).

*__alternans__ *Loew*, Centur. V, 37. Pennsylvania (Lw.); Quebec, Can.; White Mountains, N. H.

*__excentrica__ *Harris*,[23] Ins. of New England, etc., 3d ed., p. 609; fig. 267 (*Milesia*). About O. Sacken's description, given in the same volume, compare the note. New England (Harris); Illinois (O. Sacken).

*__obscura__ *Loew*, Centur. V, 35. British America. (Jaennicke, in his Neue Exot. Dipt., p. 4, says that the European *T. bombylans* occurs in North America. He probably means *T. obscura*, which is very like *bombylans*.)

LEPIDOMYIA.

Loew, Centur. V, 38, 1864.

*__calopus__ *Loew*, Centur. V, 38. Cuba.

MILESIA.

Latreille, Hist. Nat. des Crust. et des Ins. XIV, p. 331, 1804.

*__ornata__ *Fabricius*, Syst. Antl., p. 188, 5; 1805; Wiedemann, Auss. Zw. II, p. 106, 4; Macquart, Dipt. Exot. II, 2, p. 81, 4; Tab. XV, fig. 4. United States, from New England to Texas and Florida.

Musca virginiensis Drury, Illustr. II, Tab. XXXVII, fig. 6, 1773.

Syrphus trifasciatus Hausmann, Entom. Bemerk, II, p. 67, 10, 1789.

*__limbipennis__ *Macquart*, Dipt. Exot. 4e Suppl., p. 147, 8; Tax. XIV, fig. 3. North America (Macq.); Florida.

The following species, described as *Milesiae*, probably belong to other genera:

Amithaon *Walker*, List, etc., III, p. 567. North Carolina.

notata *Wiedemann*, Auss. Zw. II, p. 109, 7; Macquart, Dipt. Exot. II, 2, p. 80, 2; Tab. XV, fig. 5. Georgia, Carolina.

? Syrphus profusus Walker, List, etc., III, p. 578. Georgia.

SOMULA.

Macquart, Dipt. Exot. 2e Suppl., p. 57, 1847.

*decora *Macquart*, Dipt. Exot. 2e Suppl., p. 57, 1; Tab. II, fig. 11. Middle States.

SPHECOMYIA.

Latreille, Fam. Natur. du Regne Anim. 1825; Dict. Classique d'Hist. Nat. XV, p. 545, 1829. ([25])

*vittata *Wiedemann*, Auss. Zw. II, p. 87 (*Chrysotoxum*). Unknown locality (Wied.); New York; Virginia; White Mountains, N. H.

Psarus ornatus Wiedemann, Auss. Zw. II, p. 91, 1; Tab. IX, fig. 7; Macquart, Hist. Nat. Dipt. I, p. 491, 2; Dipt. Exot. II, 2, p. 18, 1; Tab. III, fig. 3. Georgia (Wied.).

MIXTEMYIA.

Macquart, Hist. Nat. Dipt. I, p. 491; 1834.

*quadrifasciata *Say*, Long's Exp. App. p. 377 (*Paragus*); Wiedemann, Auss. Zw. II, p. 91, 2 (*Psaras*); Macquart, Hist. Nat. Dipt. I, p. 491, Tab. XI, fig. 8. New England and Canada (Quebec; White Mountains, N. H.; Cambridge, Mass ; Connecticut.)

---

*ephippium n. sp. See No. 10 in the Appendix. Mexico.

CERIA. ([25])

Fabricius, Syst. Ent. IV, p. 277, 1794.

*abbreviata *Loew*, Centur. V, 43; compare also X, 57, nota 2. Pennsylvania, New York.

*pictula *Loew*, Neue Beitr. I, p. 17. Southern States.

*signifera *Loew*, Neue Beitr. I, p. 19. Mexico (Lw.); Texas (M. C. Z.; determination by Lw.).

---

*tridens *Loew*, Centur. X, 57. California.

---

*arietis *Loew*, Neue Beitr. I, p. 17. Mexico.

caeca *Walker*, Trans. Ent. Soc. N. Ser. V, p. 287. Mexico.

Daphnaeus *Walker*, List., etc., III, p. 537; Westwood, Trans. Ent. Soc. V, p. 231; Tab. XXIII, fig. 7; Loew, Neue Beitr., etc., I, p. 17. Jamaica.

*tricolor *Loew*, Weiner, Ent. Mon. V, p. 37. Cuba.

NOTES.

(1) *Microdon.* About the European species of this genus, see Loew, Verh. Zool. Bot. Ver., 1856.

(2) *Chrysotoxum.* About the European species, see Loew, Verh, Zool. Bot. Ver., 1856.

(3) *Paragus aeneus.* "The name *aeneus* was given by Walker in 1849 when there existed an *aeneus* Meigen (1822), now considered a synonym of *tibialis* Fallèn" (Verrall in litt.),

(4) *Chrysogaster.* About the European species, see Loew, Stett. Ent. Z., 1843, p. 204.

(5) *Chilosia.* On the European species compare Loew, Verh. Zool. Bot. Ver., 1857.

(6) *Syrphus.* Compare my paper: On the N. A. species of the genus *Syrphus*, in the Proc. Boston Soc. Nat. Hist., 1875.

(7) *Syrphus geniculatus.* About *S. guttatus* Walker, Mr. Verrall writes me that it resembles *umbellatarum;* hence I place it as a doubtful synonym of the American *umbellatarum.*

(8) *Didea fuscipes.* Differs from the European *D. fasciata* in the color of the legs only (Lw. Cent. IV, 82). Again my *D. laxa* with its greenish color, is the representative of the European *D. alneti.*

(9) *Sphaerophoria.* I restore this name, however incorrect its termination may be, as *Melitareptus* was used long before 1840 for a genus of birds.

(10) ALLOGRAPTA. *Scaeva obliqua* Say, cannot well be placed in any of the existing genera of this group. It does not possess the characteristic marks of *Mesograpta* (peculiar shape of the ocellar triangle in the male, and peculiar coloring of the thorax); it has not the large development of the hypopygium of the male of *Sphaerophoria;* it might be placed among the species of *Syrphus* with a linear abdomen. But, in the first place, these species will, sooner or later, have to be separated from the bulk of the genus; and, in the next place, *Scaeva obliqua* possesses in the structure of the eyes of the male, and in the peculiar markings of its abdomen, sufficient characters of its own. The eyes of the male are divided in two parts by a well defined line, above which the facets are larger than below; the line lies a little lower than the antennae and thus divides the eye in two unequal parts, the upper one of which is a little larger; its coloring, in life, is more red, the lower half is more purplish. This character, very striking in life, is also visible in dried specimens. I have not observed it in the species of *Syrphus*, or of *Sphaerophoria*, or of *Mesograpta*, which I examined alive. The name *Allograpta* is given in allusion to the peculiar coloration of the typical species. *Scaeva emarginata* Say, which I do not possess, is provisionally placed in the same genus. I suspect that more than one *Syrphus* from Mexico and the West Indies belongs to the same group; as for instance *S. delineatus* Macq., but, of course, it is impossible to judge from descriptions alone.

(11) *Eristalis flavipes* Syn. *Milesia barda* Say ♀ (non ♂). The original type of Say's is still preserved in the Harris collection in Boston. This synonymy explains the *brown spot* on the wings of the female, mentioned in Say's description, and which does not exist in the real female of *M. barda.*

(12) *Eristalis trifasciatus* Say (1829), seems to agree exactly with *E. transversus* Wied. (1830), and if it was not for the discrepancies in the description of the head and of the hind femora, I would not hesitate to unite both species.

(13) *Helophilus.* Compare the paper on the European species of *Helophilus* by H. Loew, in the Stett. Ent. Zeitschr., Vol. VII; several North American species are described in it.

(14) *Helophilus obscurus.* Strange as it may appear that a species originally described from the Carolinas should be a common species in very northern localities or at high altitudes in the Rocky Mountains, such seems nevertheless to be the fact. I communicated some of these northern specimens to Dr. Loew, who identified them with his *H. obscurus.*

(15) *Eristalis decisus* Walker. I saw the specimen in the British Museum in 1859, and noticed that it was a *Helophilus* with a greasy thorax, the yellow stripes of which were almost invisible. I did not, at the time, take note of the species, but the description agrees with the common *H. similis.*

(16) The synonymy does not seem doubtful; only *Hinterrand* should be read instead of *Seitenrand* in the description; without this emendation the comparison with *H. pendulus* has no sense.

(17) *Teuchocnemis. Milesia Bacuntius* Walker, and *Pterallastes lituratus* Loew, are closely allied and must be put in the same genus. Both have, in the male, curved hind tibiae, with a strong projecting spur *in the middle* (like the male of *Mallota posticata*), a character which is wanting in *Pterallastes thoracicus* Loew. The latter was described by Dr. Loew in both sexes, and therefore must be considered as the type or the genus, while of *P. lituratus* Dr. Loew described only the female. Hence arose the necessity of establishing a new genus for the other two species.

(18) *Teuchocnemis Bacuntius.* The specimens which I have from Texas do not quite agree with Mr. Walker's description of the thorax.

(19) *Xylota cjuncida* Say. I am not sure whether I am right in identifying this species with the one which is most common in New England, and agrees with Say's description, except that the antennae are more often dark than reddish; that the tarsi usually have the three last joints black, rarely two; the hind coxae in the male are armed with a spine. This last character prevents me from identifying this species with *Xyl. quadrimaculata* Loew. I have not seen any original specimen of the latter. Loew seems to have identified *cjuncida,* as appears from the note in Centur. VI, 56.

(20) On the European species of *Eumerus,* compare Loew, Stett. Ent. Z., 1848, and again Verh. Zool. Bot. Ver., 1855.

(21) On *Chrysochlamys* compare Loew, Verh. Zool. Bot. Ver. 1857.

(22) *Spilomyia.* Compare Loew, Centur. V, 33, *Nota;* but insert the word *non* before *clausa.*

(23) *Temnostoma excentrica* Harris, and *T. aequalis* Lw. The latter, in all the numerous New England specimens which I have seen, has the femora black or brown, with the tips only, more or less yellow. Harris describes the legs of his *Milesia excentrica* as "ochre-yellow, except the shanks and feet of the first pair, which are black." This agrees with some specimens from Illinois, which I have seen. These specimens have a more saturate-yellow abdomen and narrower black cross-bands than the new England specimens. But why Harris' description should agree with these Western and not with the New England specimens, I do not understand. The description of *M. excentrica*, which I prepared for the new edition of Harris' work was drawn from two western males of the above mentioned species. The female which I had before me at that time, was from Massachusetts, and I find now that I have a second female of the same kind (from Lake Superior); both differ from the western males (which I take for *T. excentrica*), as well as from *T. aequalis* in having two yellow dots on each side of the thoracic suture (like *T. alternans*), and not a yellow streak; the scutellum is darker, and its pubescence is black, not yellowish; the second abdominal segment has very little yellow, etc. I think that this is a distinct species, and that I was mistaken in taking it for the female of *excentrica*.

(24) The history of this genus is as follows:

Sphecomyia. Latreille, familles naturelles, du *Regnè* animal (1825), contains the name, without any definition. The definition appeared in the Dictionnaire classique d'histoire naturelle (by Rey and Gravier, publishers, in Paris), Vol. XV, p. 545 (1829), as follows:

Sphecomyia. Genre d'insectes de l'ordre des dipterès, établi sur une seule especè, rapporté de la Caroline par Bosc et trés voisine de celui de *Chrysotoxe*, mais très distinct par un caractére unique dans cet ordre d'insectes, celui, d'avoir la soie des insectes insérée sur le *second* article; cet article, ainsi que le précedent est long, presque cylindrique; le troisiéme ou dernier, est beaucoup plus court. La soie est simple. Le genre a été indiqué pour la premierè fois dans notre ouvrage sur les familles naturelles du regnè animal, mais sans signalement. L'especè qui lui a servi de type sera consacreé au celèbre naturaliste précité.

Latreille never described this type of the genus, however, and it was Macquart who saw Bosc's and Latreille's original specimen in the Museum at Paris, and averred that it was the same as *Chrysotoxum vittatum* and *Psarus o. nutus* of Wiedemann (Dipt. Exot. II, 2, p. 18, 1841).

Latreille's statement that the arista is inserted on the *second* antennal joint is, of course, erroneous. Macquart further mentions, l. c., that in the Berlin Museum this genus figures under the collection-name of *Epopter*. Gorski, in his Analecta ad Entomographiam, etc., 1852, proposes the generic name *Tygentyausia* for the European species of the same genus. It occurs only in Eastern Europe (Sweden, Norway, Finland, Lithuania), and, as figured by Gorski, certainly looks very like the North American species. Wahlberg (Ofoers Vetensk. Acad. Forhandl., 1854, p. 155) gives a detailed description of it.

(25) Compare H. Loew's *Ceria* in his Neue Dipterol. Beiträge, I (1835).

APPENDIX.

1. Didea laxa n. sp. ♂ ♀.

The greenish or yellow cross-bands are attenuated on the sides and come in contact with the lateral margins of the abdomen. Length, 11–13 m. m.

Female.—Face yellow, with a broad, brown stripe, front and vertex black; the former with gray dust on both sides. Antennae black. Thorax blackish-green, shining. Scutellum dull brownish-yellow, with a slight greenish or bluish metallic lustre; pleurae with a whitish spot, beginning at the humerus and connecting almost at right angles with a similar spot in the middle of the pleura. Abdomen black, with two greenish-yellow or yellow spots and two cross-bands; the spots (on the second segment) are large, oval and in contact with the lateral margin; the cross-bands (on segments 3 and 4) have a triangular notch or excision on their hind margin (in some specimens they are altogether interrupted); on each side of the notch they are convex, so as to come in contact with the abdominal margin with less than their greatest breadth; hind margin of the fourth segment margined with yellow. Venter black, segments 2, 3, 4, each, with a broad yellow cross-band at the base, coarctate in the middle. Legs yellow; proximal half of the four anterior femora black; hind femora black, except at tip; hind tibiae with a brown ring in the middle, sometimes expanding over the whole tibia; tarsi more or less brown. Wings with a distinct grayish tinge, stigma brownish; the hind vein forms a distinct sinus, encroaching upon the first posterior cell.

Male.—The white spots on the pleurae are less perceptible; the cross-bands are sometimes interrupted in the middle, especially in the smaller specimens. In one of the specimens the spots on the second segment, as well as the interrupted cross-bands are separated from the lateral margin by a distinct black interval.

Habitat, Lake Superior (collect. A. Agassiz); Norway, Me. (S. I. Smith); Mt. Washington, Alpine region (G. Dimmock). The largest lot I received from Mr. H. K. Morrison, who collected it in the White Mountains. Altogether I had fourteen males and an equal number of females.

The cross-bands and spots on the abdomen usually are greenish, like those of the European *D. alneti;* sometimes, however, they are yellow.

D. laxa differs from *D. fucipes* Loew in the shape of the abdominal cross-bands, which in the latter, become broader on each side, but do not reach the margin; also in the color of the femora, etc.

As *D. fuscipes* Loew is the American representative of the European *D. fasciata, D. laxa* represents *Didea alneti.*

2. Xanthogramma felix n. sp. ♀.

Female.—Face and cheeks yellow (in all my specimens, except one, the face has the brownish-red tinge, which the faces of *Syrphi* sometime assume); vertex dark metallic green, emitting a stripe of the same color, which reaches the base of the antennae, where it expands a little; between this stripe and the eyes, the front is yellow. Antennae black, sometimes faintly reddish on the under side, near the suture of the second and third joints; third joint rather large, oval, blunt. Thoracic dorsum of a rather bright metallic green; on each side a yellow stripe runs from the humerus to the callosity near the scutel; the latter yellow, its extreme base and corners blackish or brown. Pleurae with a large, ill-defined yellow spot below the wings. First abdominal segment with a yellow spot each side (just under the halteres); the first cross-band (on the second segment) is either interrupted by a very narrow black line in the middle, or entire; the second band is coarctate in the middle, its hind margin being a shallow obtuse angle; the same may be said of the third band, except that the obtuse angle is deeper and often has a notch in the middle, which sometimes cuts the band in two; there is a narrow fourth band at the base of the fifth segment, encroaching upon the hind margin of the preceding segment; the fifth segment has a narrow yellow posterior margin. Legs yellow, hind legs black or brown, except the base of the femora and a space on both sides of the knees. Wings with a distinct brownish tinge on their distal half, anteriorly; stigma brownish; sometimes the whole wing has a brownish-yellow tinge. Length, 9½–10½ m. m.

Habitat, Westpoint, N. Y., in Sept. 8–10, three females; Illinois; Pennsylvania. (The specimen from the latter locality is smaller, wings more hyaline, legs and antennae of a paler color.) The first and third band are as often interrupted as not; the second often shows a vestige of an interruption in the shape of an indistinct blackish line in the middle.

3. Brachyopa racua n. sp. ♂.

Brownish gray, thorax with three brown stripes; abdomen brown, its basal third whitish yellow, with a brown line in the middle; arista bare. Length, 8–9 m. m.

Face, front and vertex densely clothed with a grayish pollen; lower part of the face very much projecting; a brownish stripe runs across the cheek, from the eye to the mouth; antennae brownish, grayish pollinose; arista bare, brown, reddish at base. Thoracic dorsum yellowish-gray, with three brown stripes; the intermediate one geminate and abbreviated posteriorly. Scutellum brownish-yellow. Abdomen brown, shining; first and second segment whitish yellow (as if translucent), the second brown posteriorly and with a longitudinal brown line in the middle. Legs grayish brown; hind femora slightly incrassate on the under side, with a brush of short spine-like

bristles. Wings distinctly tinged with brownish, especially on the distal half, anteriorly; first posterior cell distinctly petiolate at the distal end, the petiole being equal in length to the small cross-vein.

Habitat, Quebec, Canada (Mr. F. X. Belanger); a single male specimen. The interval between the distal ends of the first posterior and discal cells is a shallow sinus, and not a right angle, as in the following species:

4. Brachyopa notata n. sp. (Loew in litt.) ♂ ♀.

Yellowish-ferruginous; abdomen with brown insisures and with a brown dorsal line; arista pubescent. Length, 5–6 m. m.

Face and front pale yellowish, with a yellowish silvery pollen; cheeks with a faint brownish stripe; antennae yellowish-ferruginous; arista yellowish-brown, pubescent; vertex yellowish-ferruginous. Thorax reddish above, clothed with a yellowish pollen, which leaves bare three reddish stripes; the intermediate one geminate. Scutellum reddish-yellow, nearly as long as it is broad; abdomen brownish-yellow, with the hind margins of the segments distinctly, but narrowly bordered with brown; lateral margins likewise brownish; in the middle of the back, a narrow, longitudinal brown stripe, sometimes interrupted at the incisures, in some specimens evanescent on the fourth segment. Halteres whitish. Legs brownish-yellow, hind tarsi brown. Wings somewhat tinged with brownish-yellow, more distinctly brownish on the apex and along the cross-veins at the distal ends of the first posterior and discal cells; first posterior cell short-petiolate at the distal end.

Habitat, White Mountains, N. H., beginning of July. Two males and a female. In this species the interval between the distal ends of the first posterior and the discal cell is nearly a right angle.

I have a fourth specimen, a female, from Quebec (Mr. Belanger), which is smaller, and very pale in coloring, without any brown stripe on the abdomen, the incisures but slightly infuscated, the wings almost hyaline, etc. I take it for a somewhat immature *B. notata*.

5. Criorrhina armillata n. sp. ♀.

Black, thorax bronze color, with fulvous pile; face, antennae, tip of femora, tibiae and three basal joints of tarsi yellow; tibiae with a black ring in the middle. Length, 11–12 m. m.

Face and front above the antennae honey-yellow; upper part of front and vertex blackish-bronze color, with fulvous pile; a black spot on the cheeks; antennae yellow-ferruginous, arista black. Thoracic dorsum and scutellum greenish-bronze color, clothed with erect fulvous pile; pleurae and pectus black. Abdomen black, shining, clothed with black pile; a tuft of yellow pile on each side at the base. Halteres yellow. Coxae and about two-thirds

of the femora black; the end of the latter the tibiae, except a black wing in the middle of each, and the three basal joints of the tarsi are of a saturate yellow; the two last tarsal joints black. The proximal two-thirds of the wings are tinged with yellowish, the remainder is gray; the latter coloring extends along the posterior margin as far as the axillary excision; within the yellow portion, there is a hyaline spot in the angle between the first and second veins (at the proximal end of the marginal cell); the veins near the root of the wings are all tinged with yellow.

Habitat, Quebec (Mr. Belanger). A single female specimen.

6. Arctophila flagrans n. sp. ♂.

Face wax-yellow, cheeks black; antennae; basal joints brownish; third joint reddish, the plumose arista black. Thoracic dorsum densely clothed with yellowish hair, through which, however, the metallic brownish-coppery ground-color is apparent; pleurae black in the middle with a stripe formed by yellow pile. Abdomen with long yellow pile at the base and on the sides; with reddish hair in the middle and at the tip; between the hairs, the black, metallescent ground color is apparent. Legs black; front tibiae beset on the inside with short, golden-yellow hairs; three basal joints of the four posterior tarsi brownish-red. Wings with a slight grayish tinge; a brown spot limited by the fourth longitudinal vein, the costa, the small cross-vein and the origin of the third vein, the latter vein is more deeply sinuate than in *A. bombiformis*. Length 13 m. m.

Habitat, Colorado Mountains (Lieut. W. L. Carpenter).

7. Xylota vecors n. sp. ♂ ♀.

Thorax brownish bronze-color; abdomen black; legs, including the coxae, ferruginous; end of hind femora, the hind tibiae and tarsi black. Length, 13–14 m. m.

Face and cheeks black, with a greenish reflection and a delicate whitish down on the sides; antennal reddish-brown; front black, with some black, erect hairs. Thorax brownish bronze-color, with indistinct longitudinal greenish stripes; pubescence sparse, short, erect, brownish-yellow, mixed with black; a whitish sericeous spot inside of the humeri; pleurae greenish-black, with blackish hairs; scutellum greenish bronze-color. Abdomen black, with a bluish or purplish reflection and scattered whitish and black hairs. Knob of halteres black, stem reddish. Legs ferruginous, including the coxae; the tip of the ungues brown; the distal third of the hind femora, the hind tibiae and hind tarsi black. Wings tinged with brownish, proximal half more hyaline; stigma dark brown.

Habitat, White Mountains, N. H. (E. P. Austin and H. K. Morrison). Three males and two females.

In general appearance, this species is very like the European *X. femorata;* but it differs especially in the color of the coxae, which in the latter are black. Minor differences are that in *X. femorata* the wings are more uniformly colored, less tinged with brown on the distal half, the stigma paler, etc.

8. Xylota curvipes *Loew?*

Among the specimens of *Xylota vecors* brought by Mr. Morrison from the White Mountains I found one, which is larger than the others (about 15 m. m.), has altogether black coxae, the hind femora stronger and beset on the under side with yellowish hairs, longer and more conspicuous than similar hairs which exist in *X. vecors;* the hind tibiae, somewhat more strongly curved and ending in a short, stout spur; they are beset on the inner side with very conspicuous, long, erect black hairs; the halteres are altogether reddish; the antennal arista dark brown, etc. Now all these characters, in which this specimen differs from *X. vecors*, belong to the European *X. curvipes* Loew, Neue Beitr. II, 19. As I have no specimen from the latter for comparison, I cannot settle the question of their identity, but I draw the attention of collectors to this undoubtedly distinct species. We have in this instance one of those curious cases of parallelism, as they so frequently occur between the two faunas. As *X. femorata* in Europe is supplemented by the closely resembling *X. curvipes*, the American representative of *X. femorata*: *X. vecors*, has alongside of it a species either identical or closely resembling *X. curvipes*.

Mixtemyia ephippium n. sp. ♂.

Face yellow, with a brown stripe in the middle, which does not quite reach the antennae; the latter brown; second joint almost black; triangle of the vertex dark brown. Thorax dark brown; a brownish-yellow angular line runs from the scutellum, above the root of the wings, turning inside to follow the thoracic transverse suture and stopping before meeting the corresponding line on the other side; a less distinct angular line, on the anterior part of the thorax, begins on each side, at the yellow humeral tubercle, follows the anterior margin of the thorax and before reaching its middle, turns backwards; in the middle of the anterior margin, between the two angular lines, two delicate, short parallel yellow lines are perceptible. Scutellum brown in the middle, with yellow borders. Pleurae brown; a yellow spot above the root of the front coxae. Abdomen light brown; second segment with an arcuated yellow stripe, resting with its middle on the anterior, with its ends on the posterior margin which is also yellow; the inside of the semi-circle thus formed, is dark

brown velvety; the third and fourth segments are clothed with a fine sericeous down; the third has a distinct tubercle in the middle and is margined with yellow posteriorly; the fourth is traversed by a yellow cross-band, in the shape of an inverted V, the ends of which do not reach the lateral margins; hypopygium brown. Anterior half of the wings brown, the posterior hyaline; the anal cell, the second posterior, the discal and a part of the first posterior cell, as well as the whole posterior margin, including the alula, being hyaline (in *M. quadrifasciata* the second casal cell and the whole portion of the first basal, situated behind the spurious vein are also hyaline). Legs; femora dark brown, the hind ones with a strong tooth on the under side; tibiae yellowish-brown, pale yellow at the bassi; front tarsi brown; middle and hind one reddish brown, two or three last joints brown.

Length, 12 m.m. *Hab.*, Mexico.

ADDITIONS AND CORRECTIONS TO THE LIST OF MYDAIDAE, LEPTIDAE AND DASYPOGONINA. (*)

(In the Bulletin Buffalo Soc. Nat. Sci. Vol. II, No. 3, p. 169, 1874.)

Page 173. After *Ptiolina* add SPANIA Meig. System. Beschr. VI, p. 335, 1830; with the species *S. edeta* Walker, List, etc., III, p. 489. Huds. B. Territ.

" 174. After *Mydas fulvifrons* add M. GRACILIS, Macquart, Hist. Nat. Dipt. I, p. 274, Tab. VII, fig. I. South America (Macq.); Cuba (Loew in lit.)

" 176. After *Leptogaster carolinensis*, strike out Tab. XII, fig. 71, in the synonymy; the note should read thus: *L. nitidus* Macquart quotes Tab. XII, fig. 7; the comparison however of this figure with the descriptions of *G. nitidus* and *G. Audouinii* in the letter-press shows, that the figure refers to the latter species. The name *nitidus* must be dropped, having been used before; the name *gigas*, engraved on the plate, instead of *Audouinii*, must be erased. The passage in Linn. Entom. II, p. 395, proposing to adopt the name *gigas* for *nitidus*, was written before Macquart's mistake in the quotation of the figure had been discovered. Schiner was therefore right in proposing a new name for the species.

" 178. PTESIOMMA LONGIVENURIS Schiner is a distinct species, not a synonym of *P. macra* Lw.

" 179. *Stenopogon Truquii* Bellardi, is a *Scleropogon*.

" 181. *Dasypogon* (Stichopogon) *fasciventris* Macq. is a doubtful synonym of *Stichopogon trifasciatus* Say; Bellardi refers it, as a variety, to *S. candidus* Macq.

" 182. *Nicocles argentifer* Lw. is a synonym of *N. politus* Say.

---

* Communicated by Dr. Loew.

VI. An Illustration of North American Agrotis and Oncocnemis

BY LEON F. HARVEY, A. M., M. D.

[*Read before this Society, Dec.* 3, 1875.]

THE photographic plate (III) which accompanies this paper is prepared from specimens belonging to the collection of this Society. The species are interesting either because they seem to me new to science, or as being closely allied, and perhaps not yet clearly distinguished. The genus *Agrotis* is defined by Lederer as having always the middle and hind tibiae spinose and the dorsal region of the body free from tufts. The thoracic vestiture forms a mesial crest in the subgenus *Ammoconia,* in which the females show a terminal lateral abdominal impression noticable in *Agrotis aratrix* a new Texan, and the second American species of the group. In his recently published check list (Buffalo, November, 1875), Mr. Grote has referred to Agrotis the subgenera *Anicla, Matuta, Pachnobia and Eurois.*

In addition *Ammoconia* Led. should be thus recorded, and I would propose also to distinguish under the Hübnerian designation *Ogygia* the European *A. ravida* and the *American* species having a flattened abdomen, and a casual resemblance to *Pyrophila,* such as *clandestina.*

Agrotis opaca *Harvey,* Plate 3, fig. 1.

A beautiful little species allied to *annexa.* Fore wings from the base, over costal region to t. p. line, light brown. Stigmata small, light brown; orbicular elongate, with central dot. Claviform outlined, black. The wings are else shaded with blackish. Subterminal line a series of very distinct, bright, pale marks. Cell between and beyond the stigmata deep black. Hind wings partly transparent with smoky borders and without discal mark. Collar with a black line; head and prothorax blackish; thorax brownish; legs and breast blackish; tarsi dotted. Distinguished by the small size and bright marks of the subterminal line.

Expanse, 28 m. m. Bosque Co., Texas, March 3. Mr. Belfrage (No. 540, violet label).

Agrotis sculptilis *Harvey*, Plate 3, fig. 2.

I figure the type of this species which is readily distinguished by its distinct and neat black markings on a gray ground; the outer half of the fore wings is shaded with blackish. It was collected in Texas by Mr. Belfrage, and is described in the 2d Volume of this Bulletin, on page 272.

Agrotis muraenula *Grote and Robinson*, Plate 3, fig. 3.

♀.—I illustrate the female of this lovely species, which is recognizable from the t. p. line being accompanied by white points preceded by black. The subterminal line is a faint linear shade. The hind wings are white in the male and in the female very slightly smoky without marks. The species is originally published in the transactions of the American Entomological Society, Vol. 1, page 352, Plate 7, fig. 48. Our specimens were collected by Miss Mary Walker in Erie Co., N. Y.

Agrotis scandens *Riley*, Plate 3, fig. 4.

This species resembles *muraenula* in its gray fore wings, but is readily distinguished by the distinct dark subterminal line, being followed by white cuneiform dots, and by the absence of the chain of points to the t. p. line. The hind wings have also a narrow border and distinct discal lunule. It is described by Prof. Riley in the first Missouri Report, p. 76, Plate 1, figs. 5, 7. Our specimens are from Miss Mary Walker taken in the same locality with *muraenula*.

Oncocnemis Augustus *Harvey*, Plate 3, fig. 5.

♂.—Antennae simple; thorax tufted behind; fore tibiae with a stout claw. The species in appearance resembles an *Agrotis;* in ornamentation of primaries it is near Onc. Glennyi *Grote*. The olive-brown fore wings are varied with pale yellow brown; the dentate subterminal line is near the external margin, pale and distinct. Reniform pale, lunate. Fringes long and quite pale. Lines dentate, geminate, black and pale, t. p. line inaugurated on costa within the reniform. Claviform and orbicular pale. Veins very finely marked, with light colored scales. Hind wings white with faint line and smoky border. Beneath whitish, with distinct dotted line and discal dot on hind wings. Collar pale with a central line. Thorax olive brown. Abdomen whitish.

Expanse, 30 m. m. Bosque Co., Texas. Mr. Belfrage (No. 524). Named for Mr. Grote who first discovered this interesting genus in North America, and is the author of most of our species of *Oncocnemis*. I would refer *Homohadena atricollaris* to *Oncocnemis*.

Agrotis feniseca *Harvey*, Plate 3, fig. 6.

♂.—This Californian species differs from *fuscigera* by the white hind wings, reflecting the discal point from beneath. From *Rileyana* it differs by the concolorous stigmata and different color of primaries. It is described by me in Mr. Grote's check list of the "Noctuidae of America north of Mexico," page 25.

Agrotis Bostoniensis *Grote*, Plate 3, fig. 7.

I illustrate the male of this easily recognized and handsome species; the hind wings are white in this sex, in the female they are blackish fuscous. The species has been taken by Mr. Roland Thaxter at Newtonville, Mass., in September, and is originally described in the proceedings of the Academy of Natural Sciences of Philadelphia, page 203, 1874.

Agrotis (Ammmoconia) aratrix *Harvey*, Plate 3, fig. 8.

♀.—This species is a little smaller than *chortalis*; with darker fore wings and inconspicuous lines. The stigmata are pale ringed; the median shade prominent. There is a faint ruddy tinting to the wings and body beneath and the costal edge of primaries is pale. It shows a marked resemblance to the species of *Glaea* in appearance. The subgeneric characters are well displayed. The t. p. line is geminate, nearly straight, median shade angulate on cell; fringes pale ruddy. Hind wings fuscous with pale ruddy fringes; beneath paler with incomplete line and dot.

Expanse, 35 m. m. Bosque Co., Texas. Mr. Belfrage (No. 517).

Agrotis (Ammoconia) chortalis *Harvey*, Plate 3, fig. 9.

♀.—I illustrate the type of this fine species originally described by me in the 2d Volume of this Bulletin, page 273.

Arotis introferens *Grote*, Plate 3, fig. 10.

The figure is taken from the type of this species which is allied to *auxiliaris* Grote, in form, and to *perexcellens* Grote from California, and to *turris* Grote (= cinereomacula ‡ *Grote* nec *Morr.* Proc. Acad. N. S. Phil.) in ornamentation. This specimen was sent by Mr. E. L. Graef who received it from Texas.

DECEMBER 17, 1875.

The President in the chair. Sixteen persons present.

The death of R. VON WILLEMOES-SUHM, of H. M. S. *Challenger*, a Corresponding Member of the Society, was announced.

RICHTER LAJOS, of Buda-pest, and W. G. FARLOW, of Boston, Mass., were elected Corresponding Members of the Society.

The following paper was read: On Noctuidae from the Pacific coast of North America, by AUG. R. GROTE.

Professor W. H. PITT exhibited a specimen of a dorsal impression of *Eusarcus scorpionis* from the Water Lime Group. This was the second specimen of the species discovered. The position of the animal was a reverse of that in the original type, which gave the ventral view of the species. The narrow caudal segments, comprising the "tail" of the animal, showed no indication of terminating in a spine; they were apparently incomplete as in the type.

Mr. GROTE remarked that it was possible that the tail did not in reality terminate with a spine as in *Eurypterus*. A detached impression of a broad rounded appendix was shown, conjecturally referable to *Eusarcus*. A paper on the new specimens was stated to be in preparation.

Mr. GROTE stated that he had recognized the species *Polenta Tepperi* (Belfrage, No. 129) among new Texan material in the collection of this Society. The generic diagnosis given by Mr. Morrison (Bost. Proc., 124) merely states that the fore tibiae are unarmed, so that the species cannot be referred to *Schinia*. No characters are given to define the genus; "in other structural points" Mr. Morrison says there is "but little difference." Nevertheless the genus offers some noteworthy characters which warrant its erection on other grounds than given by its author. In the peculiar structure of the clypeus it is an evident ally of *Fala* from California, as well as of the genera *Plagiomimicus*, *Stiria* and *Stibadium*. The front shows a central circular relieved rim, within which is a slight tubercle; the whole not very prominent, and concealed by the converging facial squamation; we have this style of frontal structure in the Californian genus, but much exaggerated, and with a wedge-shaped protuberance. In *Polenta*

Tepperi the ovipositor is protruded. The tegulae are as in *Plagiomimicus* and allies; they appear to stand off at the tips from the thorax. In ornamentation there is a close similarity with Plagiomimicus pityochromus *Grote* (of which *Schinia media* Morr. is suspected to be a synonym); the color is very different, but the style of ornamentation is the same; there is a similarity in the position of the lines and in the dark tri-angular spot crowning the subterminal space and inwardly limited by the costal angulation of the t. p. line. In Schinia *Hubn.*, of which genus Mr. Grote had already proposed the type (*trifascia*), there is an absence of the naked cup-like frontal projection which, in *Plagiomimicus*, extends beyond the mossy facial scales and is thus completely exposed.

VII. On Noctuidae from the Pacific Coast of North America

BY AUG. R. GROTE.

[*Read before this Society, Dec.* 17, 1875.]

In the Canadian Entomologist, Vols. 6 and 7, I published a list of 147 species, for the most part new to science, from the Pacific Coast. I have since received from Mr. Henry Edwards of San Francisco, a valuable collection of Noctuidae for determination, and upon which the present observations are based. Types and determined specimens are returned to Mr. Edwards for the benefit of the student in California, where it is hoped that the interest recently displayed in this group of insects may be maintained until the Californian fauna be completely known. At present I can hardly venture to draw general conclusions with regard to the geographical distribution of the species.

In Mr. Edwards' collection I recognize the following Eastern forms, which have now an extended range accorded to them: *Nephelodes minians,* 3990, Washington Territory; *Hadena loculata* var., 5980, Oregon; *Hadena devastatrix,* 5630, Oregon; *Oncocnemis occata,* 4473, California; *Sprageia tortricina,* 2578, California; *Agrotis campestris,* 5644, Vancouver Island; *Agrotis messoria,* 5619, Oregon; *Agrotis subgothica,* 4656, Vancouver Island; *Agrotis brocha,* 5594, Vancouver Island; *Agrotis muraenula,* 5996, Oregon; *Agrotis albipennis,* 5611, California; *Agrotis baja,* 5595, Vancouver; *Agrotis occulta,* 5591, Vancouver; *Xanthia togata,* 5590, Vancouver; *Euplexia lucipara,* 5998, Oregon. I have also examined the type of *Heliothis Crotchii;* it is smaller and darker than the Texan *cupes,* but I think they will be found identical.*

---

* The collection of this Society contains the type of the following species from Texas:

Agrotis nigrovittata n. s.

♂ ♀.—Belongs to the section *Anicla.* Fore wings pale whitish yellowish gray, with marbling or freckling of darker scales; ornamentation obliterate; two black points indicate the reniform; no black line at base of fringes which are concolorous; hind wings pure milk-white, silky, with white fringes; head and thorax concolorous with fore wings; a distinct black narrow band at base of collar; abdomen white, yellowish at anus; legs dusky; palpi black at the sides; fore wings gray beneath; hind wings white, gray on costal region. In one specimen the reniform points are absent.

Expanse, 30 to 32 m. m. Texas (Belfrage, No. 515).

It is not possible that this is *digna,* because Mr. Morrison says that species has the collar "white above, the lower half gray," and "a black line at the base of the fringe." Eight or ten specimens examined.

Bombycia improvisa.

Cymatophora improvisa Hy. Edw., Proc. Acad. N. S. Cal., 5, 189.
Bombycia improvisa Grote, Can. Ent., 6, 151.

I have examined Mr. Edwards' type. The eyes are naked, and following the arrangement of the group as given by Dr. Harvey (Bul. Buf. Soc. Nat. Sci., 1, 276) I should refer the species to the typical genus. *B. improvisa* recalls the European species *Or* and *ocularis* in ornamentation. The fringes beneath have a rosy hue, as also the apical marks of the primaries on the under surface.

Washington Territory, No. 6009, coll. Mr. Hy. Edwards.

Apatela lupini *Grote*, Bul. Buf. S. N. Sci., 2.

I had adopted the MS. name of Dr. Behr attached to some specimens which were yellowish and dusty colored, perhaps discolorous from age and condition. I photograph what seems to me a fresh example of this form. In the typical examples before me the t. p. line is heavily marked and straightly oblique opposite the cell; I rely on this character to separate a second species in which the line is narrower and here drawn in opposite the reniform.

No. 6010, Calif., coll. Hy. Edwards.

Apatela spinea n. s.

♀.—This species resembles *lupini* in structure and size, and may not be eventually considered a distinct species. It differs by the t. p. line being narrower, more continuous, less scalloped; opposite the cell, between veins 6 and 4, it is drawn in, forming, as usual, a point on the intermediate vein 5. Else, while whiter, much like its ally, the submedian dash well marked, the fringes chequered. Hind wings blackish, with white fringes; tegulæ black lined.

Expanse, 40 m. m. California, No. 2610. The caterpillar is said to be thorny, or to be provided with "bunches of spines."

Agrotis Millèri n. s.

♀.—Gray, white over black. Distinctly marked; lines single, black, denticulate; t. a. line with a single deeper inward inflection below submedian fold. Claviform large, distinctly outlined; orbicular funnel shaped, the narrow portion reaching the t. a. line; reniform narrow, elongate, luniform. All the stigmata whitish, with distinct black annuli. From the base outwardly over the claviform across the median space runs a salmon pink shade-streak. Beyond the reniform is a second similar shading. The subterminal space is largely whitish before the irregular black subterminal line; fringes chequered, black and white. Terminal line obsolete. Hind wings fuscous with white fringes. Beneath, white over fuscous; a common black shade line which is marked on the veins of secondaries. The hind wings show a discal mark.

Head and body beneath, whitish gray. Thorax above, whitish gray, with a black line on the collar and black scales centrally on the disc behind the collar, and along the sides of the dorsal vestiture. Tegulae with salmon pink inner fringing and subobsolete black marginal lines. Abdomen above, pale smoky.

Expanse, 38 m. m. Sierra Nevada, Cal., coll. Hy. Edwards, No. 5599. Perhaps the handsomest species of the genus; named for the poet, Joaquin Miller.

Agrotis cinereicollis n. s.

♀.—Allied to *badicollis*. It differs apparently by the concolorous collar, the paler tint, the pale claviform streak. Cinereous with the whole wing washed with pale bright brown, except costal region and terminal space. The cinereous stigmata are connected, approximate, the orbicular elongate, the reniform subequal, stained with blackish inferiorly, the cell between them black. A basal black streak. Claviform indicated by a long pale yellowish streak. Median lines much as in *badicollis*, but less marked. Subterminal line indicated by difference in coloration; terminal line faint, dotted. Hind wings whitish, stained outwardly, with faint lunule. Beneath, whitish; costal regions ruddy tinted, with common line obliterate on secondaries. Head and thorax whitish gray; tegulae shaded with bright brown. Abdomen pale, with exserted ovipositor.

Expanse, 34 m. m. California, No. 4579, Mr. Hy. Edwards.

Agrotis exsertistigma *Morr.* (fide auctor).

This species has leathern brown fore wings, with the orbicular open, V shaped, to the pallid costal margin. Collar pale, with a black line above. Space between and before the stigmata on cell, black. A black basal curved dash. Lines obsoletely geminate, with pale included shades which are noticeable. Thorax brown; hind wings fuscous with interlined fringes whitish outwardly. The species looks like the *cupida* group of the genus, but the abdomen is cylindrical, not flattened.

A specimen was returned me by Mr. Morrison as the type of his "exsertistigma," Bost. Proc., 1874. Subsequently I am informed that the specimen does not agree with one retained by himself, and that Mr. Morrison considers this last specimen (which I have been unable to see since sending it to him at his request originally) as the "true type" of "*exsertistigma*." I am of opinion that the descriptions published by Mr. Morrison in the article here quoted, in the genus *Agrotis*, were too indefinite to be admitted into scientific literature, and that the names there proposed should not be entitled to precedence. I have, however, tried to adopt them all

to avoid irritating questions. In this case I have adopted the first determination of the author of "exsertistigma"; if his second one obtains, the present is an undescribed species, and hence may be known as *Morrisonistigma*. This species is No. 1393 of Mr. Edwards' collection.

Agrotis costata n. s.

♀.—Allied to the preceding, but of a bright red brown. The costa broadly pallid as is the open orbicular. The t. p. line is, however, single, dark, finely lunulate. The veins are slightly indicated. The inconspicuous, linear, dark subterminal, is near the margin. Collar with a black line. Thorax red brown, in my type not well preserved. Hind wings concolorous fuscous. Beneath, fuscous, with common line and dots.

Expanse, 35 m. m. Vancouver Island, from whence also Mr. Edwards has a specimen of Agrotis brocha *Morr.* (No. 5594). The number attached to the type of *costata* is 4640.

Agrotis brunneigera n. s,

♂ ♀.—Closely allied to *fusċigera* Grote. Differs by the fore wings being tinted of an even brown; not fuscous. Median lines lunulate, obsoletely geminate, blackish. Median shade noticeable below the concolorous reniform. Claviform obsolete; in one specimen the orbicular is faintly outlined. Hind wings concolorous, dark fuscous, a little paler at base; beneath dark fuscous with broad common shade line; on secondaries, the discal point in one specimen is seen to be an annulus.

Expanse, 32 m. m. Nos. 5654 and 5612. Vancouver Island.

Agrotis albipennis n. s.

♂ ♀.—Resembles *campestris*, but differs by the white secondaries in both sexes. Orbicular large, rounded. Reniform large; both spots ringed with black; hardly a trace of the claviform Fore wings blackish; darker over costal region, paler inferiorly with a faint wood brown tinge. Thorax and head blackish; collar with a very narrow line. Beneath there is a faint common line in female, marked on the veins of secondaries; in both sexes the line is visible, angulated below costa, on fore wings.

Expanse, 35 m. m. California, No. 5611, Mr. Hy. Edwards; female, 35 m. m.; Canada, Mr. Wm. Saunders.

Agrotis baja (W. V.).

Vancouver Island; Mr. Hy. Edwards, No. 5595. The specimen is more reddish than eastern material; but does not seem to differ otherwise.

Agrotis gravis *Grote.*

♂ ♀.—California, Mr. Hy. Edwards, No. 3488. A fresh specimen has the costal region stained with purple above on fore wings. A female specimen is numbered 5660, agreeing with the male in color.

Agrotis vapularis n. s.

♂.—Allied to *gravis* but the fore wings narrower, blackish, with the subterminal dashes very distinct. Orbicular very small, pale ringed. Thorax blackish, like fore wings. Beneath fuscous with common line and distinct discal spots. Hind wings above blackish fuscous. Two specimens, Mendocino, Mr. Behrens; No. 2748, California, Mr. Hy. Edwards. This species is darker than *intrita* and with more distinct ornamention. I have been formerly of opinion that my single specimen was a form of *gravis*.

Expanse, 28–32 m. m.

Agrotis aeneipennis n. s.

♂ ♀.—Allied to *gravis*, but the color is bright brown, shining, and the ornamentation is obliterate. This species has been sent to me by Mr. James Behrens (No. 1008–1010, males). I have it also under the number 2622 (female) from Mr. Hy. Edwards, who also sends in the present collection two males (Nos. 5636 and 1390) in which the stigmata are outlined and the lines faintly visible. It is readily distinguished from *gravis* by its color, but as the ornamentation is variably distinct, I am afraid to insist on any characters drawn from ornamentation. By breeding it may eventuate that it is a race or variety of *gravis*, which it slightly exceeds in expanse.

Agrotis Ridingsiana *Grote.*

Sierra Nevada, Cal. Mr. Hy. Edwards, No. 3506.

Agrotis strigilis n. s.

♀.—All the tibiae spinose; belonging to the *tessellata* group. Fore wings thorax and head, blackish fuscous, somewhat olivaceous; at base of head and collar some ochery scales. The transverse lines are obsoletely geminate; the white or gray included shades are prominent and relieve the accompanying dark transverse lines. Lines dentate, nearly perpendicular. Stigmata moderately large, shaded with whitish; claviform concolorous, barely indicated. Terminal space a little paler; s. t. line fine, powdery gray; fringes concolorous. Hind wings pale fuscous, with paler interlined fringes; beneath translucent centrally with powdered costal region, faint discal mark and line.

Expanse, 32 m. m. Vancouver Island, No. 5652, Mr. Hy. Edwards.

Agrotis insularis n. s.

♀.—Purple red-brown with ashen costal region crossed by the geminate black transverse lines. Stigmata concolorous; cell between them and before the orbicular black. Reniform narrowly edged with pale. A black sub-basal curved dash. Course of the lines as in *exsertistigma*, collar ashen; thorax red brown. Hind wings fuscous with interlined fringes. Allied to *exsertistigma;* differs in color and in the black lines, and in the more bent subterminal followed by pale points; as well as in the more rounded orbicular.

Expanse, 34 m. m. Vancouver Island, Mr. Hy. Edwards. No. 4643.

Agrotis emarginata n. s.

♀.—Resembling *insularis*, but without pale margin to primaries. Abdomen flattened; this and the following species, with *insularis* are nearest to *formalis*. Wings narrower than in *carissima*. Dark purple brown. Collar surmounted by a narrow black line. Stigmata concolorous, sub-equal, narrowly pale margined. Lines black, geminate, indicated on costal region, else faint, no black marks or shades. Orbicular open to costa. Hind wings dark fuscous with interlined fringes. Beneath paler; costal regions stained with purplish; common line and discal mark on hind wings. Abdomen dark fuscous above; purple stained beneath.

Expanse, 33 m. m. No. 784, California, Mr. Hy. Edwards.

Agrotis facula n. s.

♀.—Dark purple brown; a slight ashen costal shade invades the stigmata. Resembles *formalis* in color and ornamentation. It differs by the black filling in on the cell; by the absence of the black band and central white line on the collar which is concolorous with the dark brown thorax, and only shows a superior black edging. The geminate lines occupy their usual position. The orbicular is open. There is an abdominal carina. Hind wings blackish fuscous. These species seem to lead into the *cupida* group of the genus.

Expanse, 34 m. m. No. 4188, California, Mr. Hy. Edwards.

Agrotis discoidalis n. s.

♀.—Fore tibiae unarmed; appearing allied to *attenta*. Fuscous or wood brown. The geminate lines as usual in this group. Cell black. Stigmata concolorous; orbicular elongate-ovate; reniform upright. Subterminal space the darkest. The general color is fuscous with a grey shade except on subterminal space. The distinctive character of this species is the black shading around the orbicular on the cell. There is a trace of the claviform. Hind wings pale fuscous with interlined fringes and the veins marked. Beneath paler with faint line and discal mark.

Expanse, 34 m. m. No. 5609, Nevada, Mr. Hy. Edwards.

Agrotis variata n. s.

♀.—Anterior tibiae unarmed; terminal space pale; this species differs by the more irregular, pale powdery s. t. line, relieved from the pale terminal shading by the ground color of the wing obtaining beyond it. The dark fore wings are stained with ocherous. The geminate lines with pale included shades are well defined and inaugurated by black costal dots. Stigmata concolorous, ill defined; orbicular round, moderately large; reniform upright, narrow; both defined by narrow, pale yellowish annuli, a diffuse pale powdering over the place of the claviform. Collar, head and palpal tips grayish; palpi black at the sides; thorax like fore wings. Hind wings dark fuscous with interlined fringes; beneath with common line *straightly* marked with black on costa of primaries.

California, No. 4573. *Expanse*, 33 m. m.

Agrotis varix n. s.

♀.—Like the preceding with pale terminal space. Of a pale drab or gray olive fuscous. Markings much like the preceding from which it seems to differ in color, in the greater width of the geminate lines and particularly in that beneath the common line is outwardly *obliquely* marked with black on the costa of primaries. Generally paler and less distinctly marked than *variata*.

Vancouver Island, No. 5615. *Expanse*, 35 m. m.

Agrotis orbis n. s.

♀.—Entirely concolorous drab or pale olive fuscous, shining; s. t. space barely differentiated by its darker tint. All the lines faint, geminate as in allied species. Distinguished by its reduced, round, complete orbicular and small upright reniform spots, annulated with pale; the orbicular distinctly margined. Head and thorax concolorous. Hind wings concolorous fuscous with interlined fringes; beneath with discontinued common line.

Expanse, 38 m. m. Sierra Nevada, Cal.; No. 4580. Mr. Hy. Edwards.

The species *orbis*, *varix*, *laetula*, *cupidissima*, *observabilis*, *variata*, seem to belong to the Eastern group represented by *cupida*, *alternata* and *brunneipennis*, having a flattened abdomen and unarmed fore tibiae. *Clandestina* (Ogygia) has the fore tibia armed.

Agrotis laetula n. s.

♂ ♀.—Allied to *cupidissima*. This species is smaller, and has a line on the collar and the thorax and fore wings of a burnt brown, strewn with ocher scales, which fill the stigmata in one specimen, and in the other leave the spots

concolorous, while encircling them and filling the geminate lines. Except in color, this form differs very little from *cupidissima*, while seeming narrower and shorter winged. All the stigmata shown. Hind wings and under surface as in *cupidissima*, which is a light red species.

Expanse, 34 m. m. Nos. 5983 and 180, California, Mr. Hy. Edwards.

Agrotis (Pachnobia) Alaskae n. s.

♂.—Allied to *carnea*. Median space deep olive brown, triangulate, entirely crossed by the pale yellow claviform. Orbicular pale, small, oblique; reniform irregularly L-shaped, narrow, with a central line. Color whitish brown with a submedian and internal brown shade on subbasal space. Subterminal line preceded by brown dashes; terminal space pale. Hind wings soiled whitish with double exterior bands. Fringes whitish. Thorax brown, mixed with whitish.

Expanse, 30 m. m. Alaska, No. 6000, Mr. Hy. Edwards. This may prove to be a local modification of *carnea*. The median lines are contiguous at internal margin.

Hadena olorina n. s.

This species from the color would be taken for an *Apatela*, but the thorax is tufted behind, and the abdomen is tufted along the dorsum; the eyes are naked. White or gray; face with a black bar. Ornamentation like *Hadena*. Lines black, narrow, denticulate, distinct. Subterminal line with following oblique fuscous shades superiorly, and again above the dash along submedian fold. This line is dentate, fine, runs inwardly opposite the cell and forms two prominent teeth at veins 3 and 4. Terminal black dots; fringes white, dentate, obsoletely black-spotted. A basal black dash. Stigmata concolorous, black-edged; reniform large, incomplete, surmounted by the fuscous median shade. Hind wings white, a little soiled with white fringes and a dotted terminal line; beneath with common line marked on veins and terminal black dots. Thorax like fore wings, with black marks on tegulae.

Expanse, 42 m. m. No. 6007, California, Mr. Hy. Edwards.

Mamestra Nevadae n. s.

♀.—Smaller than *lubens*, between this species and *subjuncta*. Dark blackish brown, shaded with light red brown or leather brown at base above the basal dash and beyond the reniform, and again below vein 2 over subterminal space. Claviform small, concolorous; orbicular pale, small; reniform large, shaded outwardly with light brown. Median lines as usual; subterminal near the margin, distinct, white, with prominent W-mark. Hind wings black-

ish fuscous, without marks. Beneath, concolorous blackish fuscous with dot on secondaries. Thorax blackish, tufted. Eyes hairy.

Expanse, 36 m. m. No. 4582, Mr. Hy. Edwards, Sierra Nevada, California.

Mamestra comis n. s.

♂.—Stouter than *laudabilis* and shaggier. Rich brownish black. Tegulae, basal and subterminal spaces whitish, of various shades, slightly olive or lilac. Median space rich brown with the small oval reniform greenish white; the smaller orbicular is oblique, black-ringed, a very little paler than the wing. Hind wings fuscous. Anal hairs ochery. Abdomen fuscous. Beneath with a gray cast, somewhat irrorate, with faint common line and reduced dots. Head, collar and thorax blackish; collar with a black line; the white tegulae also with an inner line. Subterminal line of the primaries olivaceous; a ter minal fine pale festooned line cutting the brown fringes.

Expanse, 26 m. m. No. 5585, coll. Mr. Hy. Edwards, Vancouver Island.

Mamestra alboguttata n. s.

♀.—Narrow winged, glossy, black and white. Fore wings blackish with white lines, the basal wide. Reniform white, subquadrate, with central shading; orbicular minute, black ringed, concolorous, round. Subterminal space shade outwardly with whitish, relieving black cuneiform marks; fringes checkered, medially interlined with pale. Secondaries pale smoky, subhyaline; abdomen untufted, shining, pale fuscous; beneath, breast and abdomen whitish. Secondaries beneath whitish with smoky borders, very faint line and dot. Thorax blackish with white stripe on the tegulae; disc whitish behind.

Expanse, 25 m. m. No. 5971, Oregon; also No. 5987, with the thorax more white.

Acerra muricina n. s.

♂.—Eyes hairy; antennae bipectinate; smaller than *normalis,* and shaded with brown. Prothorax brown, discolorous, tegulae gray. Primaries with gray terminal space; median space shaded with brown, with the stigmata whitish, varied with brown, united, forming a long U. Transverse lines indicated, brown. Hind wings unicolorous brownish fuscous. Beneath, paler, irrorate, with a rufous tinge; a line and spot on hind wings.

Expanse, 32 m. m. No. 5999, Oregon, coll. Mr. Hy. Edwards. The genus seems to me related to *Graphiphora,* rather than where I have placed it in describing *normalis.* The thorax is broad in front; abdomen not exceeding secondaries.

Choephora *Grote and Robinson.*

With this genus I am now disposed to unite *Pseudorthosia*. In both the tibiae are spinose, and the naked eyes are lashed. The color and habitus and ornamentation are those of the group of which *Orthosia* and *Glaea* are representative genera. C. variabilis *Grote*, is represented in Mr. Edwards' collection. C. pectinata, *Grote*, is known from Colorado (Mr. Mead), and has fuscous hind wings. C. fungorum *G. & R.*, the type, from the East, is of a reddish fawn color, and is distinguishable by the quadrate red spot on the primaries between the obsolete stigmata. Mr. Edwards' collection contains two specimens (wanting antennae) from Washington Territory (No. 4177) and Vancouver Island (No. 4425), while sufficiently indicating a new species more nearly allied to *fungorum*, but differing by the absence of the quadrate spot on fore wings. The antennae in *Choephora* are pectinate, most strongly so in *C. fungorum*. The abdomen exceeds the hind wings and the genus differs besides from *Metalepsis* by the more prominent head and spinose fore tibiae.

Choephora blanda n. s.

Fore wings olive or yellowish fawn; at first sight the species looks like a *Glaea*, the hind tibiae (all that I have been able to examine) are, however, spinose as in the other species. Ornamentation simple; t. a. line sinuous, outwardly oblique; it is outwardly rounded over s. c. and m. veins, a little notched on cell, inwardly rounded to vein 1, thence outwardly to internal margin which it joins near the middle. Stigmata concolorous or a little darker than the wing, pale ringed; orbicular small, oblique; reniform upright, squarish. T. p. line evenly rounded; both lines blackish with pale linings. S. t. line distinct, a chain of blackish marks. Hind wings silky reddish, concolorous, with trace of median line; beneath, both wings reddish with common exterior line. Thorax like fore wings; abdomen like hind wings, a little yellowish.

Expanse, 40 m. m.

Cleophana eulepis n. s.

♀.—The antennae are simple, scaled above, pubescent beneath. The fore tibiae have a short terminal claw; the front bulges. Eyes naked and lashed; collar medially produced. The ornamentation resembles that of a *Cucullia* of the *scrophulariae* group. Whitish gray. Lines oblique, indistinct; stigmata obsolete. A black streak runs from the t. p. line at submedian fold to the exterior margin at vein 2. A terminal cuneiform black mark between veins 3 and 4. The t. p. line is geminate, whitish and black, and is noticeable chiefly on costal and internal margins. Veins more or less marked with black. A black streak on internal margin between the transverse lines which are

here approximate. The primaries are more whitish at base; in their shape resembling Cucullia. White costal ante-apical dots are noticeable. Hind wings blackish fuscous, paler at base, with whitish fringes. Beneath, pale fuscous, powdered along the margins with gray; the white fringes showing distinctly and on costal region of primaries two pale ante-apical dots are prominent. Collar with a fine black line at base. Thorax behind with a mossy tuft outwardly blackish. Abdomen untufted.

Expanse, 35 m. m. Oregon, Mr. Edwards, No. 5995.

The type of *C. occata*, has the lobes of the collar slightly raised in front. Fresh specimens do not show this character, the collar being perfectly plain. *Cleophana* may then be restricted to this species from Oregon; a specimen from California (in too indifferent condition to make out) indicates a distinct form. I must, then, refer *C. occata* to *Oncocnemis*. In this latter genus we have six species in the check list. A ♀ specimen of the subsequently described *O. riparia* has occurred in the vicinity of Buffalo. A specimen numbered 27, sent by Mr. Mead from Colorado, differed from the type of *Chandleri* by the diffuse band of the hind wings which is more distinctly limited in the figured type. In the Eastern specimens the s. t. line is more distinctly marked with pale dashes. The female *O. riparia* taken about Buffalo, has the hind wings exactly like this second Colorado specimen, and beneath the dotted line is shown as in *Chandleri*. The course of the transverse lines seems identical, so far as they can be made out, so that the difference between the two forms is limited to the more distinctly black marked primaries in *Chandleri*, and the greater prominence of the s. t. line in *riparia*, the female of which wants the black streak ending in the claviform shown by two males sent me by Mr. Fred. Tepper. As I now observe that the character of the hind wings given by Mr. Morrison is not essential, there is greater probability that we have to do with a single species subject to some modification over so wide a range of territory.

Explanation of Plate IV.

1. Agrotis alaskae.
2. Agrotis gravis.
3. Agrotis vapularis.
4. Agrotis Milleri.
5. Agrotis costata.
6. Agrotis cinereicollis.
7. Apatela spinea.
8. Agrotis exsertistigma, *vel* Morrisonistigma.
9. Agrotis discoidalis.
10. Apatela lupini.
11. Agrotis facula.
12. Agrotis variata.
13. Hadena olorina.
14. Agrotis laetula.
15. Hadena cucullifformis Grote, Check List, 24.

The figures on Plates 3 *and* 4, *are reduced about one-eighth from natural size.*

JANUARY 7, 1876.

Vice-President HAYES in the chair. Eighteen members present.

Dr. GERHARD ROHLFS, of Weimar, was elected an Honorary Member of the Society.

R. V. STODDARD, M. D., of Rochester, was elected a Corresponding Member of the Society.

The following papers were read: On the genus Eusarcus by A. R. GROTE and W. H. PITT. A new marine Fucoid from the Water Lime Group by A. R. GROTE and W. H. PITT.

The discovery of a marine Fucoid from the Water Lime Group was announced by Mr. A. R. GROTE and Professor PITT, and the type specimen of the species was exhibited. For the species the name BUTHOTREPHIS LESQUEREUXI *Grote* and *Pitt*, was proposed. The specimen is one of the best preserved of the kind yet discovered. No remains of Fucoids appear to be known hitherto from the Water Lime Group of the Silurian. The specimen shows no close affinity to any fucoidal remains known. It is comparable to *Butholepis succulens* Hall of the Trenton Limestone and to *Chondrites antiquus* of the Clinton, as well as to *C. furcatus* of Brongniart. The specimen exhibits a number of branches irregularly mingled by compression. Stem (originally cylindrical) flattened, branching from the base, erect, branches mostly simple, sparingly dichotomous, three to four millimeters thick, gradually widening to nearly one centimeter at the very obtuse or round truncate point; surface smooth. Branches mostly simple from the base, thirteen to fourteen centimeters long. The upper impression of the specimen had been presented to Professor Leo Lesquereux, of Columbus, Ohio, after whom the new plant was named.

March 3, 1876.

The President in the chair. Eighteen persons present. The following papers were read :

Concerning the Fishes of the Ichthyologia Ohiensis by David S. Jordan, M. D.

Synonymic List of the Butterflies of North America north of Mexico, Part II, Rurales, by Samuel H. Scudder.

Mr. Thos. E. Bean of Galena, Illinois, was elected a Corresponding Member.

Exchanges were acknowledged from the following Societies and individuals :

Kongliga Vetenskaps-Societeten, Upsala.
Kongelige Norske Frederiks Universitetet, Christiania.
Kongelige Danske Videnskabernes Selskab, Copenhagen.
Imperial Academy of Sciences, St. Petersburg.
Russian Entomological Society, St. Petersburg.
Nederlandsche Entomologische Vereeniging, Leiden.
Entomologischer Verein, Berlin.
Naturwissenschaftliche Gesellschaft "Isis," Dresden.
Naturforschende Gesellschaft, Danzig.
Naturwissenschaftlicher Verein, Hamburg.
Naturhistorische Gesellschaft, Hannover.
Royal Dublin Society, Ireland.
Zoologisch-Mineralogischer Verein, Regensburg.
Entomologischer Verein, Stettin.
Verein für vaterländische Naturkunde in Württemberg.
K. K. Geologische Reichanstalt, Vienna.
K. K. Zoologisch-Botanische Gesellschaft, Vienna.
Société Vandoise des Sciences Naturelles, Lausanne.
Société de Physique et d'Histoire Naturelle, Geneva.
Société Entomologique de Belgique, Brussels.
Revue et Magazin de Zoologie, Paris.
Societa Toscana di Scienze Naturali, Pisa.

Königl. Baierische Akademie der Wissenschaften, Munich.
Naturforschende Gesellschaft, Zurich.
Entomological Society, London.
Royal Society of Tasmania, Australia.
Gill College, Somerset East, South Africa.
F. Sumichrast, Mexico.
Arthur G. Butler, Esq., London.
M. Achille Guenée, Chateaudun.
Thomas Twining, Esq., Dublin.
W. F. Kirby, Esq., Dublin.
Dr. A. Speyer, Rhoden.
Prof. P. C. Zeller, Stettin.
H. B. Moeschler, Kronförstchen.
Editor "Grevillea," London.
The American Philosophical Society, Philadelphia.
The Department of the Interior, Washington.
Editors of the American Journal of Science and Arts, New Haven.
The Boston Society of Natural History.
The American Academy of Arts and Sciences, Boston.
The Cincinnati Society of Natural History.
The Peabody Academy of Science, Salem.
The Museum of Comparative Zoology, Cambridge.
The Academy of Natural Sciences, Philadelphia.
Cornell University, Ithaca.
The Wisconsin Academy of Science, Arts, and Letters, Madison.
The Academy of Science, St. Louis.
The California Academy of Sciences, San Francisco.
The Minnesota Academy of Natural Sciences, Minneapolis.
Academia Nacional de Ciencias Exactas, Buenos Aires.
The Cambridge Entomological Club.
Editor of the Canadian Entomologist.
Editors of the American Naturalist.
Smithsonian Institution, Washington.

The Secretary presented a communication from a Committee of the Boston Society of Civil Engineers on the Metric System of Weights and Measures.

VIII. Concerning the Fishes of the Ichthyologia Ohiensis

BY DAVID S. JORDAN, M. S., M. D.

(*Read before this Society, March* 3, 1876.)

VERY early in the history of American Science, there was published, in the backwoods of Kentucky, a little octavo volume of 90 pages, bearing the following title: "Ichthyologia Ohiensis; or, Natural History of the Fishes inhabiting the Ohio River and its tributary streams, preceded by a physical description of the Ohio and its branches. By C. S. Rafinesque, Professor * * * * * * *, Lexington, Kentucky. 1820. Printed for the author by G. W. Hunt. (Price one dollar.)"

This book has now become exceedingly rare, but as Rafinesque's names for our fishes have priority of date over those of almost all other authors who have written on the Ichthyology of our inland waters, excepting Le Sueur, it becomes a matter of importance to those interested in the stability of our nomenclature to find out and adopt his names whenever the species and groups to which they were intended to apply can be ascertained.

In this paper I have given a list of the genera, subgenera and species described by Rafinesque, the page in the Ichthyologia on which those descriptions occur, and the equivalent in modern nomenclature of those species and groups, or, more exactly, the names which at present I think they ought to bear.

In the left-hand column, that of Rafinesque's names, the numbering and sequence is that of the Ichthyologia, and the authority for each name, unless otherwise expressed, is that of Rafinesque. Several species which the author never saw are more or less incoherently described from accounts given by other persons, especially from drawings by Audubon, who does not appear to have been very successful in the delineation of fishes. These species are here designated by a star (*). A number of generic groups had been previously characterized by Rafinesque in the American Monthly Magazine and other publications. Excepting in two or three cases

(*Haploidonotus, Hopladelus, Litholepis*), this does not affect the question of priority, and as those publications are not accessible to me, I shall take no notice of them in this paper. The groups printed in capitals (as PERCA) were considered by Rafinesque as genera; those in small capitals (as STIZOSTEDION) as subgenera, although in several cases he suggests the true generic value of these lower groups. In the right-hand column the style of printing is the same. The synonymy is given only in cases of recent changes of nomenclature. Identifications original with the author are designated by a dagger (†).

RAFINESQUIAN NAMES.	Page.	MODERN NAMES.
Genus I. PERCA Linnaeus	20	
Subgenus STIZOSTEDION	23	= STIZOSTEDIUM. (Syn. *Lucioperca* Cuvier, 1829).
1. Perca salmonea	21	Stizostedium salmoneum Raf.
LEPIBEMA	23	= LEPIBEMA ⟨ ROCCUS Mitchill (1817).
2. Perca chrysops	22	Roccus chrysops (Raf.) Gill.
POMACAMPSIS	23	= ?
3. Perca nigropunctata*	23	Stizostedium sp. ? (very bad).
II. AMBLODON	24	= HAPLOIDONOTUS Raf. (1818).
4. Amblodon grunniens	24	Haploidonotus grunniens (Raf.) Gill.
III. CALLIURUS	26	⟨ MICROPTERUS Lacepéde (1802).
5. Calliurus punctulatus	26	Micropterus sp. (probably salmoides).
IV. ICTHELIS	27	⟩ ICHTHELIS, etc. (Syn. *Lepomis* Cope.)
TELIPOMIS	27	= CHAENOBRYTTUS Gill (*nearly*). (Syn. *Calliurus* Ag.)
6. Icthelis macrochira	27	? Ichthelis macrochira (Kirt.) Bliss.
7. Icthelis cyanella	28	Chaenobryttus cyanellus† (Raf.) Jordan. (Syn. *Calliurus punctulatus* ? *longulus* and *formosus* Grd.);
8. Icthelis melanops	28	Chaenobryttus melanops (Raf.) Gill. (Syn. *Chaenobryttus mineopas* Cope.)
POMOTIS	28	(Not *Pomotis* of Cuvier and Auct.)
9. Icthelis erythrops	29	Ambloplites rupestris (Raf.) Gill.
10. Icthelis aurita	29	Ichthelis auritus Raf.
11. Icthelis megalotis	29	Ichthelis megalotis Raf. Bliss. (Syn. *Pomotis nitidus* Kirtland.)

Rafinesquian Names.	Page.	Modern Names.
V. LEPOMIS	30	= MICROPTERUS Lacepéde.
Aplites	30	
12. Lepomis pallida	33	? Micropterus nigricans (C. & V.) Gill.
13. Lepomis trifasciata	31	Micropterus salmoides (Lac.) Gill.
Nemocampsis	31	
14. Lepomis flexuolaris	31	Micropterus salmoides (Lac.) Gill.
Dioplites	32	
15. Lepomis salmonea	32	Micropterus salmoides.
16. Lepomis notata	32	Micropterus salmoides.
Ambloplites	33	= AMBLOPLITES.
17. Lepomis ictheloides	32	Ambloplites rupestris (Raf.) Gill.
VI. POMOXIS	33	= POMOXYS.
18. Pomoxis annularis	33	Pomoxys annularis Raf.
VII. APLOCENTRUS	34	= ?
19. Aplocentrus calliops*	34	(A myth!)
VIII. POGOSTOMA	34	= ?
20. Pogostoma leucops*	35	(A myth!)
IX. ETHEOSTOMA	35	Family ETHEOSTOMIDAE.
Aplesion	36	Subfamily POECILICHTHYINAE.
21. Etheostoma calliura	36	Micropterus salmoides (Lac.) Gill.
22. Etheostoma flabellata	36	Catonotus flabellatus (Raf.) Putnam.
23. Etheostoma nigra	37	Nothonotus niger (Raf.) Jordan.† (Syn. *Etheostoma maculata* Kirt.)
Diplesion	37	Subfamily ETHEOSTOMINAE.
24. Etheostoma blennioides	37	Hyostoma blennioides (Raf.) Jordan.† (Syn. *H. cymatogrammum* (Abbott) Cope.)
25. Etheostoma caprodes	38	Percina caprodes (Raf.) Grd.
X. POMOLOBUS	38	= POMOLOBUS.
26. Pomolobus chrysochloris	39	Pomolobus chrysochloris Raf.
DOROSOMA	39	= DOROSOMA.
27. Dorosoma notata	40	Dorosoma cepedianum (Le S.) Gill. (Var.?)
XII. NOTEMIGONUS.	40	= NOTEMIGONUS.† (Syn. *Stilbe* Dekay.)
28. Notemigonus auratus	40	Notemigonus americanus† (Raf.) Jordan.
XIII. HYODON Le Sueur.	41	= HYODON.
Amphiodon	41	
29. Hyodon amphiodon	42	Hyodon tergisus Le Sueur (adult).
30. Hyodon heterurus	42	Hyodon tergisus Le Sueur (younger).
Glossodon	42	
31. Hyodon vernalis	43	Hyodon tergisus (Spring.).

Rafinesquian Names.	Page.	Modern Names.
Clodalus	43	
32. Hyodon clodalus Le Sueur	43	Hyodon tergisus.
33. Hyodon tergisus Le Sueur	44	Hyodon tergisus.
XIV. SALMO Linnaeus	44	= SALMO.
34. Salmo alleghaniense	45	Salmo fontinalis Mitchill.
35. Salmo nigrescens	45	Salmo fontinalis Mitchill.
XV. MINNILUS	45	
36. Minnilus dinemus	46	Probably some *Alburnellus.*
37. Minnilus notatus	47	Hyborhynchus notatus (Raf.) Ag.
38. Minnilus microstomus	47	Hybopsis microstomus (Raf.) Jordan.† (Syn. *H. gracilis* Ag.)
XVI. LUXILUS	47	
Chrosomus	47	= CHROSOMUS.
39. Luxilus erythrogaster	47	Chrosomus erythrogaster Raf.† (not of Ag. = *C. pyrrhogaster* Jordan.) (Syn. *Chrosomus oreas* Cope.)
Luxilus		= LUXILUS (*Hypsilepis* Baird†).
40. Luxilus chrysocephalus	48	Luxilus cornutus (Raf.) Jordan.†
41. Luxilus kentuckiensis	48	? Luxilus cornutus.
42. Luxilus interruptus	49	(Not identified.)
XVII. SEMOTILUS	49	= SEMOTILUS.
43. Semotilus dorsalis	49	Semotilus corporalis (Mitch.) Putn.
44. Semotilus cephalus	49	Semotilus corporalis.
45. Semotilus diplemius	50	Perhaps Luxilus diplaemia ("Raf.") Jordan.
XVIII. RUTILUS	50	= LEUCISCUS, etc.
46. Rutilus plargyrus	50	Luxilus plargyrus (Raf.) Jordan.† (Syn. *Luxilus kentuckiensis* Kirt.)
47. Rutilus compressus	51	(Not certainly identified.)
48. Rutilus amblops	51	(Not certainly identified.)
49. Rutilus melanurus	51	? Ptychostomus duquesnei (Le S.) Ag. (young).
50. Rutilus anomalus	52	? Campostoma anomalum (Raf.) Ag.
51. Rutilus ? ruber*	52	Luxilus diplaemia (Raf.) Jordan.* (Syn. *Hypsilepis diplaemia* Cope.)
XIX. PIMEPHALES	52	= PIMEPHALES.
52. Pimephales promelas	52	Pimephales promelas Raf.
Moxostoma	54	(Not MOXOSTOMA of Agassiz.)
53. Catostomus anisurus	54	Ptychostomus anisurus (Raf.) Jordan.† (Syn. *Ptychostomus collapsus* Cope.)
54. Catostomus anisopterus*	54	Carpiodes sp.

Rafinesquian Names.	Page.	Modern Names.
Ictiobus	55	= ICHTHYOBUS.
55. Catostomus bubalus	55	Ichthyobus bubalus (Raf.) Ag.
56. Catostomus niger*	56	Bubalichthys niger (Raf.) Ag.
Carpiodes	56	= CARPIODES.
57. Catostomus carpio	56	Carpiodes carpio (Raf.) Jordan.† (Syn. ? *Carpiodes nummifer* Cope.)
58. Catostomus velifer	56	Carpiodes velifer (Raf.) Ag.
59. Catostomus xanthopus	57	? Hypentelium nigricans (Le S.) Jordan.
XX. TERETULUS	57	
60. Catostomus melanops	57	Erimyzon melanops (Raf.) Jordan.

Note.—This species is congeneric with the *Moxostoma oblongum* of authors, but that name (*Moxostoma*) was first applied to a species of *Ptychostomus*. Moxostoma then, if used at all, must supersede *Ptychostomus*. For the genus of which *Cyprinus oblongus* of Mitchill is the type, I would propose the name of *Erimyzon*, a free translation of the vernacular name of Chub-sucker, by which the species are sometimes known.

61. Catostomus melanotus	58	Probably Campostoma or Ceratichthys.
62. Catostomus fasciolaris*	58	Erimyzon oblongus (Mitch.) Jordan.†
63. Catostomus erythrurus	59	Ptychostomus duquesnei (Raf.) Ag.
64. Catostomus flexuosus	59	Catostomus teres (Mitch.) Le S.‡
Eurystomus	60	= ?
65. Catostomus ? megastomus*	59	A myth ?
Decactylus	60	
66. Catostomus duquesnei	60	Ptychostomus duquesnei (Le S.) Ag.
67. Catostomus elongatus	60	Cycleptus elongatus (Le S.) Ag.
XXI. CYCLEPTUS	61	= CYCLEPTUS.
68. Cycleptus nigrescens*	61	Cycleptus elongatus (Le S.) Ag.
XXII. PIMELODUS Lacepéde	61	
Ictalurus	61	
Section *Elliops*	62	= ICTALURUS.
69. Pimelodus maculatus	62	Ictalurus punctatus (Raf.) Jordan. (Syn. *Silurus punctatus* Raf. (1818). *Ictalurus caerulescens* (Raf.) Gill.)
70. Pimelodus caerulescens	63	Ictalurus punctatus.
71. Pimelodus pallidus	63	Ictalurus punctatus.
72. Pimelodus argyrus	64	Ictalurus punctatus.
Section *Leptops*	64	
73. Pimelodus viscosus	64	Hopladelus sp. ?

Rafinesquian Names.	Page.	Modern Names.
Section *Opladelus*	64	= HOPLADELUS (1818).
74. Pimelodus nebulosus	64	Hopladelus olivaris (Raf.) Gill (1818).
Section *Ameiurus*	65	= AMIURUS.
75. Pimelodus cupreus	65	Amiurus cupreus (Raf.) Gill.
76. Pimelodus lividus	65	Amiurus (? cupreus var.) lividus (Raf.) Jordan.†
77. Pimelodus melas	66	? Amiurus nebulosus (Le S.) Gill.
78. Pimelodus xanthocephalus	66	Amiurus nebulosus (Le S.) Gill.
Section *Ilictis*	66	= HOPLADELUS.
79. Pimelodus limosus	67	Hopladelus sp.
XXIII. PYLODICTIS	67	= HOPLADELUS.
80. Pylodictis limosus*	67	Hopladelus sp.
XXIV. NOTURUS	67	= NOTURUS.
81. Noturus flavus	68	Noturus flavus Raf.
XXV. HYPENTELIUM	68	HYPENTELIUM.† (Syn. *Hylomyzon* Agassiz.)
82. Hypentelium macropterum	68	Hypentelium nigricans† (Le Sueur) Jordan.
XXVI. SARCHIRUS	69	= LEPIDOSTEUS (young).
83. Sarchirus vittatus	69	Lepidosteus sp. (very bad).
XXVII. ESOX Linnaeus	70	= ESOX.
Picorellus	70	= Picorellus.
84. Esox vittatus	70	Esox sp.
85. Esox salmoneus	71	Esox salmoneus Raf. (Syn. *E. umbrosus* Kirt. *E. cypho* Cope.)
XXVIII. LEPISOSTEUS Lacepéde	71	= Family LEPIDOSTEIDAE.
Cylindrosteus	72	
86. Lepisosteus platostomus	72	Cylindrosteus platystomus (Raf.) Grd.
87. Lepisosteus albus	73	Cylindrosteus sp.
88. Lepisosteus oxyurus	73	? Lepidosteus osseus (L.) Ag.
89. Lepisosteus longirostris Mit.	74	Lepidosteus osseus.
Atractosteus (1820)	75	= LITHOLEPIS† (1818).
90. Lepisosteus ferox	77	Litholepis adamantinus† Raf. (1818).
XXIX. LITHOLEPIS	76	= LITHOLEPIS.† (Syn. *Atractosteus* Girard.)
91. Litholepis adamantinus*	76	Litholepis adamantinus Raf.
XXX. ANGUILLA Thunberg	77	= ANGUILLA.
Conger	77	
92. Anguilla laticauda	77	Anguilla rostrata (Le S.) Dek. (Syn. *A. bostoniensis* (Le S.) Dek.)

Rafinesquian Names.	Page.	Modern Names.
93. Anguilla aterrima	78	Anguilla rostrata (Le S.) Dek.
94. Anguilla xanthomelas	78	Anguilla rostrata (Le S.) Dek.
95. Anguilla lutea	78	Anguilla rostrata (Le S.) Dek.
XXXI. ACIPENSER Linnaeus	78	= Family ACIPENSERIDAE.
Sturio	78	
96. Accipenser maculosus (Le S).	79	Acipenser maculosus Le S.
97. Accipenser platorhynchus	80	Scaphirhynchus platyrhynchus (Raf.) Baird.
Sterletus	80	
98. Accipenser serotinus	80	? Acipenser rubicundus Le Sueur.
99. Accipenser ohiensis	81	? Acipenser rubicundus.
100. Accipenser macrostomus*	81	? Acipenser rubicundus.
XXXII. DINECTUS	82	
101. Dinectus truncatus*	82	Acipenser sp. (from an erroneous drawing.)
XXXIII. POLYODON Lacepéde	82	= POLYODON (young).
102. Polyodon folium Lacepède	82	Polyodon folium Lacepède.
XXXIV. PLANIROSTRA Le Sueur	83	= POLYODON (aged and toothless.)
103. Planirostra edentula Le S.	83	Polyodon folium.
XXXV. PETROMYZON Linnaeus	84	= Family PETROMYZONTIDAE.
104. Petromyzon nigrum	84	Petromyzon niger Raf.

SUPPLEMENT.

XXXVI. PEGEDICTIS	85	= PEGEDICHTHYS.† (Syn. *Potamocottus* Gill.)
105. Pegedictis ictalops	85	Pegedichthys ictalurops† Raf. (Syn. *Potamocottus carolinae* Gill. *Cottus meridionalis* Girard.)
VI. ETHEOSTOMA	85	
106. Etheostoma fontinalis	85	Catonotus flabellatus (Raf.) Putnam.
XVII. SEMOTILUS		
107. Semotilus? notatus*	86	*Melanura,* or some Cyprinodont.
XXVI. SARCHIRUS		
108. Sarchirus? argenteus*		? ? Labidesthes sicculus Cope.
XXXI. ACCIPENSER	86	
109. Accipenser lagenarius	86	? Polyodon folium Lacepéde.
XXXVII. PRISTIS Latham	86	= PRISTIS.
110. Pristis Mississipiensis	86	Pristis antiquorum (L.) Latham.
XXXVIII. PROCEROS	87	= ?
111. Proceros maculatus*	86	A myth ?

IX. Synonymic List of the Butterflies of North America, North of Mexico

BY SAMUEL H. SCUDDER.

[*Read before this Society, March* 3, 1876.]

Part II. RURALES.

In continuing the list of North American Butterflies from the preceding volume of this Bulletin (pp. 233–269), the writer wishes to call attention to the fact that the analytical tables for the readier determination of the genera, are prepared solely for the purpose of assisting the student, and are by no means supposed to include structural characters alone; on the contrary, trivial features, such even as mere coloration, markings or size, have been employed wherever it seemed simpler to use them. The list is prepared on the same plan as its predecessor.

The same generous assistance that enabled me to make the former part of this list so complete, has been extended to me in the preparation of its continuation. In particular, Messrs. W. H. Edwards, Henry Edwards and T. L. Mead, have not hesitated to send me everything from their ample cabinets which could possibly aid me; others, though with more limited resources, have assisted me with equal generosity. Mr. W. H. Edwards has given me the results of his recent examination of some of Dr. Boisduval's types; and as I myself formerly made direct comparison of specimens with those in Dr. Boisduval's collection, through his ever-ready courtesy, there are but few species of the many that have been described the last twenty-five years, the original types of which I have not seen; most of the few that I have not seen have been lost.

Our knowledge of this part of our fauna has vastly increased within the last fifteen years, or since American naturalists first commenced a systematic study of the butterflies of their own country. Of the one hundred and twelve species here catalogued, sixty-

one, or more than one-half, have been published within that period. Of the remaining fifty-one, twenty-one were described by Boisduval in his paper on the Lepidoptera of California, in 1852; previous to which time very few species (not over twenty-five) were known to inhabit the United States.

CAMBRIDGE, Mass., Feb. 29, 1876.

TABLE FOR THE DETERMINATION OF THE GENERA—*Continued.*

NOTE.—The student is requested to correct the following errors which were overlooked in the table of Part I (Bulletin, Vol. II), p. 236; the first part of category 26, should read *fore wings* instead of *both wings*. P. 237; the second part of category 42, should read *gently curved* instead of *greatly curved*.

63. Fore tarsi of males destitute of spines beneath; upper surface of wings ornamented either with black-edged white spots or with metallic lines.....(**Vestales**) **64.**

63. Fore tarsi of males densely spined beneath; upper surface of wings never ornamented as above.....(**Plebeii**) **65.**

64. Upper surface of wings marked with many delicate parallel transverse lines.....**Calephelis.**

64. Upper surface of wings marked with conspicuous black-edged white spots.....**Chrysobia.**

65. Subcostal nervure of hore wings emitting two superior nervules.....**66.**

65. Subcostal nervure of hore wings emitting three superior nervules....**78.**

66. Antennae increasing so regularly in size as scarcely to show the limits of the very long club; stalk uniformly dark.....**Eumaeus.**

66. Antennal club perfectly distinct; stalk generally annulate with white... (part of **Ephori**) **67.**

67. Hind wings without any threadlike tails, but sometimes lobed.....**68.**

67. Lower median nervule of hind wings terminating in a threadlike tail. **73.**

68. Inner border of hind wings rather conspicuously excised, the anal angle with an inward directed lobe (often falling downward).....**69.**

68. Inner border of hind wings but little or scarcely excised, the anal angle not lobed.....**71.**

69. Hind wings rounded (♀), or produced at the anal angle, so that the hind and inner border form less than a right angle (♂).....**Strymon.**

69. Hind wings of similar shape in the two sexes.....**70.**

70. Under surface of wings brown.....**Incisalia.**

70. Under surface of wings green.....**Callophrys.**

71. Male with a discal stigma on fore wings; inner margin of hind wings of both sexes distinctly excised.....**Callipsyche.**

71. Male without discal stigma; inner margin of hind wings scarcely at all excised in either sex.....**72.**

72. Upper surface wholly brown; cell shorter than fore wing....**Satyrium.**

72. Upper surface more or less blue; cell longer than fore wing.....**Erora.**

73. Males with a discal stigma at upper extremity of the cell in fore wings....74.
73. Males without any discal stigma....77.
74. Discal stigma of male extending far beyond the extremity of the cell; antennae not annulate....Atlides.
74. Discal stigma wholly or almost wholly confined to the cell....75.
75. Discal stigma as broad as long....76.
75. Discal stigma much longer than broad....Thecla.
76. Club of antennae spatulate, not more than four times as long as broad....Callicista.
76. Club of antennae cylindrical, eight or ten times as long as broad....Eupsyche.
77. Inner transverse stripe on under surface of hind wings with only shallow or no zigzag indentions....Uranotes.
77. Inner transverse stripe on under surface of hind wings, with several deep zigzag indentions....Calycopis.
78. Fore tarsi of male armed at tip with a single stout tapering curved spine; tarsi, especially fore tarsi, armed with one or two rows of spines on the under surface only. Upper surface of wings generally blue, especially in the males....(Adolescentes and a few others) 79.
78. Fore tarsi of male armed at tip with a pair of straight spines differing from the others only in their somewhat greater size; tarsi, especially fore tarsi, armed with spines on sides, and often above, as well as underneath. Upper surface of wings generally more or less fulvous....(Villicantes) 91.
79. Hind wings tailed....80.
79. Hind wings not tailed....(part of Adolescentes) 82.
80. Tail of hind wings threadlike....81.
80. Tail of hind wings triangular....Habrodais.
81. Hind wings with decided angulations....Hypaurotis.
81. Hind wings regularly rounded....Everes.
82. Eyes more or less pilose....83.
82. Eyes entirely naked....86.
83. Submarginal markings on under surface of hind wings more or less distinct....84.
83. Submarginal markings on under surface of hind wings wanting....Nomiades.
84. Terminal joint of palpi more than one-third as long as the penultimate....Leptotes.
84. Terminal joint of palpi less than one-third as long as the penultimate. 85.
85. A spot in the middle of the cell of the fore wings; a longitudinal streak in that of the hind wings....Phaedrotes.
85. No spot in the cell of fore wings, and no longitudinal streak in that of the hind pair....Cyaniris.
86. Antennae longer than the cell of the fore wings....Brephidium.
86. Antennae no longer than the cell of the fore wings....87.

87. One or two variegated ocelli at anal angle of hind wings beneath..... **Hemiargus.**

87. Ocelli at anal angle of hind wings beneath, when present, similar to rest of hind border.....**88.**

88. Under surface of hind wings with complete submarginal series of orange or metallic markings.....**Rusticus.**

88. Posterior margin of hind wings without colored markings on the under surface ; or, if present, only in the females, next the anal angle and to but a slight degree.....**89.**

89. Upper surface of fore wings of both sexes with a distinct series of spots midway between the tip of the cell and the apex.....**Philotes.**

89. Upper surface of fore wings without distinct spots, excepting occasionally, where they are indistinct and occur only in the female.....**90.**

90. Outer half of under surface of hind wings covered with irregular series of markings broadly bordered with white, so as to make the ground color of the outer half of the wing paler than the basal half..... **Agriades.**

90. Outer half of under surface of hind wings of the same tint as the basal half, the submarginal markings simple, often subobsolete....**Cupido.**

91. Hind wings tailed.....**Thersalia.**

91. Hind wings not tailed.....**92.**

92. Basal joint of middle and hind tarsi of male decidedly thickened... **93.**

92. Basal joint of middle and hind tarsi of male barely or not at all thickened .....**95.**

93. Upper surface of wings of males bright coppery.....**Chalceria.**

93. Upper surface of wings of males brown or brownish coppery.....**94.**

94. Expanse of wings more than 25 m. m. Markings of under surface heavy, and on middle of hind wings formed of round spots, those in the medio-submedian interspace outside the others.....**Gaeides.**

94. Expanse of wings usually, especially in male, less than 25 m. m. Markings of under surface usually (excl. *Mariposa*) light, and on middle of hind wings always either formed of connected or nearly connected transverse lunules, or if of roundish spots, those in medio-submedian interspace in a regular curve with the others.....**Epidemia.**

95. Under surface of hind wings with orange submarginal markings....**96.**

95. Under surface of hind wings with no orange markings.....**Feniseca.**

96. Orange submarginal band of hind wings as broad below as above. Expanse of wings more than 30 m. m.....**Chrysophanus.**

96. Orange submarginal band of hind wings narrower below than above. Expanse of wings less than 30 m. m. .....**Heodes.**

SYNONYMIC LIST OF AMERICAN RURALES.

Family **RURALES** *Fabr.* (1793).

[Plebeii rurales *Linn.*, 1758; Ruricoles *Walck.*, 1802; Lycaenida *Leach*, 1815; Zephyrides *Billb.*, 1820; Erycinidae *Swains.*, 1820–1; Ruralia *Grav.*, 1843; Onisciformes *Newm.*, 1871.]

I. Subfamily VESTALES *Herbst* (1798).

[Napaeae *Hübn.*, 1816; Amphipodes *Hoffm.*, 1818; Anopluriform strips *Horsf.*, 1828; Erycinides *Boisd.*, 1836; Erycinites *Blanch.–Brullé*, 1840; Erycinitae, *Luc.*, 1853; Heteropodes *Wallengr.*, 1853; Lemoniidae *Kirb.*, 1871; Heteropi *Guen.*, 1875.]

1. **CALEPHELIS** *Grote–Robinson* (1869).

Type: Calephelis caenius *Grote–Rob.*

188. borealis *Grote–Rob.*, Ann. Lyc. Nat. Hist. N. Y., 8, 351–3 (*Nymphidia*); Ib., Trans. Am. Ent. Soc., 2, 310–11 (*Charis-Calephelis*); Kirb. Syn. Cat. Lep., 319 (*Charis*); Scudd., Syst. Rev., 29 (*Polystichtis*); Grote, Can. Ent., v. 144 (*Calephelis*).

Geda Boisd., MSS. (*Nymphidia*).

New York to Virginia, and westward to Michigan and Illinois (Tehuantepec, Columbia).

189. Caeneus *Linn.*, [nec Ceneus Cram. et Fabr.] Syst. Nat. Ed., 12, 796 (*Papilio*); Bates, Proc. Linn. Soc. Lond., Zool. 9, 444 (*Charis*).

Cerea Hübn., Verz. bek. Schmett., 18 (*Polystichtis*).

Cereus Doubl., List Lep. Brit. Mus., 2, 16 (*Charis*).

Caenius Grote–Rob., Trans. Am. Ent. Soc., 2, 310 (*Charis-Calephilis*).

virginiensis Boisd., Griff. Cuv. An. Kingd., 15, pl. 58, figs. 1, 1a (*Erycina*).

Pumila Boisd.–LeC., Lép. Am. Sept., 131, pl. 37, figs. 6–7 (*Nymphidia*); Grote, Can. Ent. v. 144 (*Calephelis*).

Southern third of the United States, east of the Plains.

190. *Nemesis *Edw.*, Trans. Am. Ent. Soc., 3, 212 (*Charis*).

Arizona.

The description of this insect is very insufficient.

2. **CHRYSOBIA** *Boisd.* (1869).

Type: Lemonias Mormo *Feld.*

191. virgulti *Behr*, Proc. Cal. Acad. Nat. Sc., 3, 178 (*Nemeobius*); Bates, Proc. Linn. Soc. Lond., Zool. 9, 448 (*Lemonias*); Kirb., Syn. Cat. Lep., 324 (*Apodemia*).

sonorensis Feld., Nov. Reise, Lep., 303 (*Apodemia*).

Southern California (Sonora).

192. Mormo *Feld.*, Wien. Ent. Monatschr., 3, 271 (*Lemonias*); Ib., Reise Nov. Lep., 302–3, pl. 37, figs. 15, 16 (*Apodemia*).
Mormonia Boisd., Ann. Soc. Ent. Belg., 12, 52–3 (*Chrysobia*).
dumeti Behr, Proc. Cal. Acad. Nat. Sc., 3, 178 (*Nemeobius*).
California, Nevada, Utah, Arizona, New Mexico. Boisduval gives Oregon, but probably by mistake; witness his name.

193. *Palmerii *Edw.*, Trans. Am. Ent. Soc., 3, 195 (*Lemonias*).
Utah.

194. *Cythera *Edw.*, Trans. Am. Ent. Soc., 4, 345–6 (*Lemonias*).
Arizona.

II. Subfamily PLEBEII *Cuv.* (1798).

[Ephori et Cives *Herbst*, 1798; Agrodiaeti *Hübn.*, 1816; Lycaenidae *Steph.*, 1828; Vermiform stirps *Horsf.*, 1828; Theclinae *Swains.*, 1832; Lycaenides *Boisd.*, 1840; Lycaenites *Blanch.–Brullé*, 1840; Lycaenoidae *Wallengr.*, 1853; Lycaenitae *Luc.*, 1853; Lycaenina *Herr.–Schaeff.*, 1864; Ephori *Scudd.*, 1872; Micropi *Guen.*, 1875; Sulcatae *Guen.*, 1875.]

I. Tribe: Eumeidae *Doubleday* (1847).

[Euménides *Boisd.*, 1836.]

3. EUMAEUS *Hübner* (1816).

Type: Rusticus Adolescens Minijas *Hübn.*

195. *Minijas *Hübn.*, Samml. Exot. Schmett., I (*Rusticus adolescens*); Boisd., Spec. Gen. Lép., pl. 21, fig. 6 (*Eumenia*).
Toxea God., Encycl. Meth., 9, 826 (*Eumenia*).
Minyas Hübn., Verz. bek. Schmett., 67 (*Eumaeus*).
Texas, N. Mexico (Mexico and Central America).

196. Atala *Poey*, Cent. Lép. Cuba I [5–7], pl. [2] (*Eumenia*); Doubl., List Lep. Brit. Mus., 2, 20 (*Eumaeus*).
Toxea Gray [nec God.], Griff. Cuv. An. King., 2, 787, pl. 43, fig. 3, 3 a-b (*Eumenia*).
Southern Florida (Cuba).
Food-plant: *Zamia pumila*.

II. Tribe: Ephori *Herbst* (1798).

[Papiliones subcaudati, Wien. Verz., 1775; Armati *Hübn.*, 1816; Theclides *Kirb.*, 1858; Theclinae *Butl.*, 1869; Theclidae *Guen.*, 1875.]

4. INCISALIA *Minot* (1872).

Type: Licus Niphon *Hübn.*

197. Niphon *Hübn.*, Zutr. Exot. Schmett., 2, 7, figs. 203–4 (*Licus*); Boisd.-LeC., Lép. Am. Sept., 105–6, pl. 33, figs. 1–4 (*Thecla*); Min. MS., Scudd., Syst. Rev., 32.

Nephon Westw.-Hewits., Gen. Diurn. Lep. 486 (*Thecla*).

Nipha Morr., Cat. Lep. N. Am., 12 (*Thecla*).

Plautus Abb. (nec. Fabr.), Draw. Ins. Geo., Brit. Mus., 6, 55, figs. 173–5; 16, 36, tab. 112 (*Papilio*).

Nova Scotia and Canada, southward to Pennsylvania and (mountains of?) Georgia, westward to Colorado and Texas.

Food-plants: *Pinus mitis, P. strobus, P. Taeda, Juniperus?, Lupinus perennis??*

198. Eryphon *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 290 (*Thecla*).

Eriphon Morr., Syn. Lep. N. Am., 100 (*Thecla*).

Northern California and Sierra Nevada.

199. Irus *God.*, Encycl. Méth., 9, 674 (*Polyommatus*); Boisd.-LeC., Lép. Am. Sept., 101–2, pl. 31, figs. 5–6 (*Thecla*); Scudd., Syst. Rev., 32 (*Incisalia*).

Arsace Boisd.-LeC., Lép. Am. Sept., 103–4, pl. 32, figs. 1–5 (*Thecla*).

Henrici Grote-Rob., Trans. Am. Ent. Soc., 1, 174–5 (*Thecla*); Min. MSS. in Scudd. Syst. Rev., 32 (*Incisalia*).

Iris Morr., Syn. Lep. N. Am., 97 (*Thecla*).

Southern New England and New York to South Carolina and Georgia. Mr Henry Edwards also accredits it to Vancouver's Island, and it is reported from Eastern Kansas by Mr. F. H. Snow.

Food-plants: *Vaccinium corymbosum, Leucothoe racemosa, Cyrilla racemifolia, Ilex.*

200. Augustus *Kirb.* (*Thecla*).

IRIOIDES Boisd., Ann. Soc. Ent. Fr. [2], 10, 289–90 (*Thecla*).

Augustus Kirb., Faun. Bor.-Am., 4, 298, pl. 3, figs. 4–5 (*Thecla*).

Augustinus Westw., Gen. Diurn. Lep., 486 (*Thecla*).

[Western form] Saskatchewan to Colorado and California, Oregon and Vancouver's Island.

CROESIOIDES.

Augustus Harr., Ins. Inj. Veg., 3d Ed., fig. 108 (*Thecla*); Scudd., Proc. Ess. Inst., 3, 165 (*Thecla*); Min. MS. Scudd. Syst. Rev., 31–32 (*Incisalia*).

[Eastern form] Canada and New England, southward along the Appalachians to West Virginia.

Food-plants: *Quercus? Gaylussacia resinosa?*

These two forms differ from each other slightly, but with apparent constancy. Irioides is slightly the larger, never has the median stripe of the under surface of the hind wings bordered with white, as sometimes occurs in Croesioides; it lacks generally the depth of tint upon the basal half of the under surface of the hind wings, peculiar to Croesioides, the male has a smaller discal stigma, and the female has nearly the whole upper surface of the wings distinctly suffused with dull ferruginous.

5. CALLOPHRYS *Billb.* (1820).

[Lycus *Hübn.*, 1816, preocc.]

Type: Papilio rubi *Linn.*

201. dumetorum *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 291 (*Thecla*).
viridis Edw., Proc. Acad. Nat. Sc., 1862, 223 (*Thecla*).
affinis Edw., Proc. Acad. Nat. Sc., 1862, 223–4 (*Thecla*).

California, Nevada, Utah.

Food-plant: *Hosackia.*

C. dumetorum differs but slightly from *C. rubi* of Europe, and is the only one of our hair-streaks that may be thought common to the two continents. Our species has the upper surface of the wings darker than the European, with less of a russet hue; and the mesial band of white spots on the under surface of the hind wings is less frequently subobsolete, and almost always nearly or quite straight; while in *C. rubi*, when continuous it curves as much as the hind border, to which it is parallel. After an examination of the type of *affinis*, I cannot see why it should be specifically distinguished from *dumetorum*. Mr. Henry Edwards informs me that it occurs only in elevated districts, and thinks it should be separated as a mountain variety.

6. STRYMON *Hübn.* (1816).

Type: Chrysophanus Mopsus *Hübn.*

202. Titus *Fabr.*, Ent. Syst., 3, 1, 297 (*Hesperia*); God., Encycl. Méth., 9, 688 (*Polyommatus*); Steph., Cat. Lep. Brit. Mus., 1, 260 (*Thecla*); Westw., Gen. Diurn. Lep., 494 (*Lycaena*); Butl., Cat. Fabr. Lep., 191 (*Strymon*).
Mopsus Hübn., Zutr. Exot. Schmett., 1, 24, figs. 135–6 (*Chrysophanus*); Ib., Vez. Schmett., 74 (*Strymon*); Boisd.-LeC., Lép. Am. Sept., 109–110, pl. 34, figs. 1–6 (*Thecla*).

Maine, New Hampshire, Southern Ontario, Minnesota and Iowa, to Georgia, Alabama and Texas, and westward through Missouri and Kansas to Colorado, New Mexico, Northern Oregon and Vancouver's Island.

Food-plants: *Conoclinium coelestinum, Quercus*, wild cherry, cultivated plum.

7. ERORA *Scudd.* (1872).

Type: Thecla laeta *Edw.*

203. laeta *Edw.*, Proc. Acad. Nat. Sc. Phil., 1862, 55–6 [pl. 1, figs. 1–2, ined.] (*Thecla*); Ib., Butt. N. Am., 1, 139, pl. 47, figs. 1–4 (*Thecla*); Scudd., Syst. Rev., 32.

Clothilde Edw., Proc. Ent. Soc. Phil., 2, 15 (*Thecla*).

Ontario, Quebec and Maine (along the Appalachians?) to West Virginia.

8. SATYRIUM *Scudder.*

Type: Lycaena fuliginosa *Edw.*

This genus which both Edwards and Boisduval referred to the Ephori is allied to Erora, but in the sobriety of its markings and coloration is in striking contrast to that group, recalling to a certain degree a tone of color common among Oreades or Satyrids, whence the name I have applied to it. The center of the eyes is thinly pilose; the palpi, though slight, are longer than the eyes by the whole length of the terminal joint. The fore tibiae are three-fourths and the middle tibiae seven-eighths the length of the hind tibiae. The wings are broader than in Erora, resembling more those of Callipsyche, but, as in the former genus, the male has no discal stigma on the front pair, and the hind wings are scarcely excavated at the tip of the inner border; the first superior subcostal nervule of the fore wings arises at or just before the middle of the cell, and the latter is a little less than half as long as the wing. In the markings of the under surface of the wings Satyrium resembles Callipsyche more closely than Erora, but in structure it seems more nearly allied to the latter.

204. fuliginosum *Edw.*, Proc. Acad. Nat. Sc., Philad., 1861, 164 (*Lycaena*); Kirb., Syn. Cat. Lep., 364 (*Cupido*); Keferst., Zeitschr. ges. Naturw., 44, 227 (*Gen. indescr.*); Streck., Lep. Rhop.-Het., 89 (*Lycaena*).

Suasa Boisd., Ann. Soc. Ent. Belg., 12, 51 (*Lycaena*).

Sierra Nevada, California.

9. CALLIPSYCHE *Scudder.*

Type: Thecla Behrii *Edw.*

A genus allied to Erora and to a certain extent to Callophrys, in general form. The male has a long, very narrow and inconspicuous discal stigma on the fore wings; the hind wings are rather broader than in Erora, and, besides being much less produced and less angulate at the anal angle, have a slight arcuate excision in the medio-submedian interspace and a much deeper excision at the outer third of the inner margin; there are no tails. The antennae are slightly longer than in Erora and have rather a shorter club; fore tibiae of male a little more than three-fourths the length of the hind tibiae; middle tibiae scarcely longer than the front pair; neuration of fore wings of male scarcely disturbed (as it is in Thecla) by the discal stigma.

205. Behrii *Edw.*, Trans. Am. Ent. Soc., 3, 18–19 (*Theela*); Keferst., Zeitschr. ges. Naturw., 44, 227 (*Thestor?*).

Central California; Nevada (Mazatlan, Mexico—H. Edwards).

10. CALLICISTA *Grote* (1874).

Type: Callicista ocellifera *Grote*.

206. Columella *Fabr.*, Ent. Syst., 3, 1, 282 (*Hesperia*); God., Encycl. Méth., 9, 638 (*Polyommatus*); Butl., Cat. Fabr. Lep., 189 (*Tmolus*).

Bubastus pars Doubl. (nec *Bubastus* Cram.), List. Lep. Brit. Mus., 2, 30 (*Thecla*).

Eurytulus Hübn., Samml. Exot. Schmett., 2 (*Tmolus*); Weid., Cat. N. Am. Butt. 36 (*Polyommatus*).

modesta Mayn., Amer. Nat., 7, 178 (*Lycaena*).

ocellifera Grote, Bul. Buf. Soc. Nat. Sci., 1, 178–9 (*Callicista*).

Erytalus Boisd., MS.; see Butl. Cat. Fabr. Lep., 189.

Western New York, Southern Florida, Texas (West Indies, Mazatlan, Mexico.)

The occurrence of this insect in the neighborhood of Buffalo is most extraordinary.

11. URANOTES *Scudder*.

[Callipareus *Scudd.* 1872 preocc.]

Type: Strymon Melinus *Hubn.*

207. Melinus *Hübn.*, Zutr. Exot. Schmett., 1, 22, figs. 121–2 (*Strymon*); Westw., Gen. Diurn. Lep., 486 (*Thecla*); Scudd., Syst. Rev., 30 (*Callipareus*).

Mellinus Grote–Rob., Trans. Am. Ent. Soc., 1, 173 (*Thecla*).

Silenus Doubl., List Brit. Mus., 2, 31 (*Thecla*).

hyperici Boisd.–LeC., Lép. Am. Sept., 90–91, pl. 28, figs. 1–5 (*Thecla*).

Favonius Boisd.–LeC. (nec Sm.–Abb.), Lép. Am. Sept., 95–8, pl. 30, figs. 1–5 (*Thecla*); Morr. (nec Sm.–Abb.), Syn. Lep. N. Am. 95–6 (*Thecla*).

humuli Harr., Ins. Inj. Veg., 1st Ed., 215–6 (*Thecla*).

Pan Harr. (nec Drury), Hitchc. Rep. Geol. Mass., 1st Ed., 590 (*Thecla*).

Atlantic to Pacific and from the Canadian border to the Gulf of Mexico (and southward to Venezuela).

Food-plants: *Humulus lupulus, Crataegus apiifolia, Hypericum aureum, Phascolus, Pinus (?).*

Eastern representatives of this species seem to differ from those I have seen from the Pacific Coast in the darker colors of both surfaces of the wing (which are soft pearly gray beneath, in California examples), and usually in more distinct and extensive orange edging to the mesial band of the under surface of the hind wings.

208. **Acis** *Drury*, Ill. Nat. Hist., 1, 2, pl. 1, figs. 2, 2 (*Papilio*); Westw., Drury, Exot. Ent., 1, 3, pl. 1, figs. 2, 2 (*Thecla*).

Mars Fabr., Gen. Ins., 268 (*Papilio*); Ib., Ent. Syst., 3, 1, 265 (*Hesperia*); God., Encycl. Méth., 9, 635 (*Polyommatus*); Hübn., Exot. Schmett., 2 (*Strymon*).

Key West (Antilles); Drury gives it wrongly from N. York.

12. CALYCOPIS *Scudder.*

Type: Rusticus armatus Poeas *Hübn.*

A genus of exquisite little butterflies with sharply defined markings, resembling Uranotes in the want of a discal stigma upon the fore wings, it seems in other particulars to have closer relations with Thecla. The antennae have a rather short but fusiform club, much broader than the very slender stalk; the fore wings are rather broader than in Thecla and the hind wings, tailed as in that genus, are not produced so much in their lower half as most of the species of Thecla, in this respect resembling more the species of Thecla placed nearest Uranotes in this list; the cell is more than half the length of the fore wings in the male and slightly less than half the length in the female; the first superior subcostal nervule arises as far out as the middle of the outer two-thirds of the cell, even in the female; the fore tibiae are nearly two-thirds as long as the hind tibiae and the middle tibiae are of an exactly intermediate length.

209. **Cecrops** *Fabr.*, Ent. Syst., 3, 1, 270 (*Hesperia*); God., Encycl. Méth., 9, 636–7 (*Polyommatus*); Doubl.–Westw., Gen. Diurn. Lep., 485 (*Thecla*); Butl., Cat. Fabr. Lep., 189 (*Tmolus*).

Poeas Hübn., Samml. Exot. Schmett., 1 (*Rusticus armatus*); Boisd.–LeC., Lép. Am. Sept., 111–2, pl. 35, figs. 1–4 (*Thecla*).

Beon Hübn. (nec Cram.), Verz. Schmett., 75 (*Strymon*).

Boisduval and Kirby give *Beon* God., as a synonym, but wrongly.

Southern half of United States—Kentucky and West Virginia southward—east of the Plains (West Indies; Guatemala; Panama.)

Food-plant: *Vaccinium ?*

13. THECLA *Fabricius* (1807).

[Thecla et Mitura *Scudd.*, 1872.]

Type: Papilio spini *Wien. Verz.*

Division 1.

210. **Damon** *Cram.*, Pap. Exot. 4, pl. 390, figs. C, D (*Papilio*); Harr., Hitchc. Rep., 1st Ed., 590 (*Thecla*).

Gryneus Hübn., Verz. Schmett., 74 (*Lycus*).

Damastus God., Encycl. Méth., 9, 640, pl. 41, figs. 14, 14, bis (*Polyommatus*).

smilacis Boisd.-LeC., Lép. Am. Sept., 107–8 pl. 33, figs. 5–8 (*Thecla*); Scudd., Syst. Rev., 31 (*Mitoura*).
auburniana Harr., Ins. Inj. Veg., 3d Ed., 277–8 (*Thecla*).
castalis Edw., Trans. Am. Ent. Soc., 3, 208 (*Thecla*).

Atlantic States from Massachusetts to N. Florida; Westward to Great Plains.
Food-plants: *Smilax, Juniperus virginiana* (?).

211. ***Siva** *Edw.*, Trans. Am. Ent. Soc., 5, 110–1 (*Thecla*).
Arizona.

Division 2.

212. **spinetorum** *Boisd.*, MS.; Hewits., Ill. Diurn. Lep., 3, 94–5, pl. Thecla, 45, figs. 198–9 (*Thecla*).
California, Sierra Nevada, Mt. Shasta District.

213. **Ninus** *Edw.*, Trans. Amer. Ent. Soc., 3, 270–1 (*Thecla*).
Colorado.
Edwards describes the female and not the male of this species.

Division 3.

214. **Nelsoni** *Boisd.*, Ann. Soc. Ent. Belg., 12, 43–4 (*Thecla*).
Mendocino County and Sierra Nevada, California.
This insect has a curious resemblance to Incisalia Irus.

215. **Saepium** *Boisd.*, Ann. Soc. Ent. Fr. [2] 10, 288–9 (*Thecla*).
Chalcis Behr, MSS.; Edw., Trans. Am. Ent. Soc. 2, 376 (*Thecla*).
California to Colorado.

I can see no constant difference between specimens received from different persons under these two names.

Division 4.

216. ***sylvinus** *Boisd.*, Ann. Soc. Ent. Fr. [2] 10, 287–8 (*Thecla*).
California.

217. **Putnami** *H. Edw.*, Proc. Calif. Acad. Sc., 1876.
Spring Lake, Utah.
This species will shortly be described by Mr. H. Edwards.

218. **Dryope** *Edw.*, Trans. Am. Ent. Soc., 3, 19–20 (*Thecla*).
Coast Range, California to Colorado.

219. **acadica** *Edw.*, Proc. Acad. Nat. Sc. Phil., 1862, 55 [pl. 1, figs. 3–4, ined.] (*Thecla*); Ib., Bntt. N. Am. 1, 140–2, pl. 47, figs. 5–7 (*Thecla*).
californica Edw., Proc. Acad. Nat. Sc. Phil., 1862, 223 (*Thecla*).
Souhegan Whitn., Proc. Bost. Soc. Nat. Hist., 12, 162–3 (*Thecla*).
Borus Boisd., Ann. Soc. Ent. Belg., 12, 43 (*Thecla*).
Cycnus Edw., Trans. Am. Ent. Soc., 3, 207–8 (*Thecla*).

Northern New England to Pennsylvania, westward through Ottawa and London in Ontario, Michigan and Illinois, to Nevada, California and Vancouver's Island (Nicaragua).

Food-plant: *Salix.*

The Californian specimens of this species which I have seen differ from eastern examples only in having the upper surface of the wings usually of a slightly warmer tint, and in the more frequent spreading of the fulvous spot (upon the upper surface of the hind wings), into a pale fulvous bloom over the surrounding parts; but neither of these features is peculiar to them. The spot on the under surface of the hind wings in the costo-subcostal interspace seems also to be further removed from the base than in eastern examples. At most the two might be considered geographical races of one species, but I think them scarcely worthy of even that distinction. The form found in the mountains of California (Lake Tahoe, &c.,) and Nevada, has been described as distinct under the name of Cygnus; it is of a richer and darker color than valley specimens, with larger spots; perhaps it is worthy of a varietal name.

220. **Edwardsii** *Saund.*, MS., Grote–Rob., Trans. Am. Ent. Soc., 1, 172 (*Thecla*).
Fulacer Harr. (nec God.), Ins. Inj. Veg., 3d Ed., 276 (*Thecla*).
Calanus Grote–Rob. (nec Hübn.), Trans. Am. Ent. Soc., 1, 172–3 (*Thecla*).
Fabricii Kirb., Syn. Cat. Lep., 654 (*Thecla*).

Southern New Hampshire, Southern Ontario, Wisconsin and Iowa, to Pennsylvania (?) Foot-hills of Colorado.

Food-plant: *Quercus ilicifolia.*

The name Fabricii, given by Kirby, is evidently an error of copying.

221. **lorata** *Grote–Rob.*, Trans. Am. Ent. Soc., 1, 171–3 (*Thecla*).

Virginia.

Possibly this is not distinct from the following species, but I have never noticed in that the delicate line of blue scales near the base of the wings beneath.

222. **Calanus** *Hübn.*, Samml. Exot. Schmett., 1 (*Rusticus armatus*); Ib., Ind. Exot. Lep., 2 (*Strymon*); Doubl., List Lep. Br. Mus., 2,30–31 (*Thecla*).
Fulacer God., Encycl. Méth., 9, 633 (*Polyommatus*); Boisd.–Le C., Lép. Am. Sept., 92–4, pl. 29, figs. 1–5.
inorata Grote–Rob., Trans. Am. Ent. Soc., 1, 323–4 (*Thecla*).
? auretorum Boisd., Ann. Soc. Ent. Fr. [2], 10, 288 (*Thecla*).

Canada, Michigan, and Central Iowa to Eastern Kansas, Texas, Alabama, and Georgia; California?

Food-plants: *Quercus rubra, Q. falcata,* etc.; *Carya, Crataegus* (?).

Although Calanus has not yet been recognized in recent Californian collections, *T. auretorum* Boisd., appears to me to have been described from a poor specimen of this species.

223. Liparops *Le C.*, Boisd.–Le C., Lép. Am. Sept., 99–100, pl. 31, fig. 1–4 (*Thecla*).

strigosa Harr., Ins. Inj. Veg., 3d Ed., 276 (*Thecla*); Edw., Butt. N. Am., 1, 144–5, pl. 48, figs. 3–6 (*Thecla*).

Montreal, Ontario, Southern Michigan and Iowa, southward to Georgia; westward by Kansas to foot-hills of Colorado.

Food-plants: *Quercus rubra*, *Q. Catesbyi*, etc.; *Castanea*, *Ilex*, *Vaccinium* (?), *Crataegus*; apple, willow in confinement.

Mr. Edwards has attempted to throw doubt upon my determination of the species to which Abbot's drawings should be referred. To one who has seen the drawings and is familiar with all the known species of the eastern coast, there can be no doubt. Boisduval was inclined to refer it to the Favonius of Sm.–Abb., simply for want of a species which it would more resemble. This we have in the strigosa of Harris, which (like Abbot's figure) is unlike any other species in the extent and distribution of the paler markings of the under surface of the wings. Boisduval's description was plainly not "drawn from the plate," as Mr. Edwards says, but from Abbot's original drawing in his possession, which I have carefully examined. A comparison of description and plate will show this. That the plate is a poor representation, no one will deny; but it is sufficient, with the facts I have produced, to determine the species.

224. Ontario *Edw.*, Trans. Am. Ent. Soc., 2, 209–10 (*Thecla*); Ib., Butt. N. Am., 1, 143–4, pl. 48, fig. 1–2 (*Thecla*).

Canada, New England.

Division 5.

225. Tetra *Behr*, MS., Edw., Trans. Am. Ent. Soc., 3, 19 (*Thecla*).

California.

226. Adenostoma *H. Edw.*, Proc. Calif. Acad. Sc., 1876 (*Thecla*).

Tehachipi Pass, Southern California.

This species will shortly be described by Mr. Henry Edwards.

Division 6.

227. Alcestis *Edw.*, Trans. Am. Ent. Soc., 3, 271–2 (*Thecla*).

Texas.

228. Autolycus *Edw.*, Trans. Am. Ent. Soc., 3, 271 (*Thecla*).

Missouri to Texas.

Food-plant: *Quercus obtusiloba*.

229. Favonius *Smith–Abb.*, Lep. Ins. Geo., 1, 27–8, pl. 14 (*Papilio*); God., Encycl. Méth., 9, 635 (*Polyommatus*); Doubl., List Ins. Br. Mus., 2, 31 (*Thecla*).

South Carolina to Southern Florida. (Kirtland undoubtedly refers to another species in placing this in Northern Ohio and New York.)

Food-plant: *Quercus nigra*.

14. EUPSYCHE *Scudder.*

Type: Thecla M-album *Boisd.-Le C.*

This group is closely allied to Thecla, and especially to that portion of it near which it is here placed, but it is readily distinguishable from it. The antennae are comparatively short, being less than half the length of the fore wings in the male, with a very long club, not conspicuously and abruptly thicker than the stalk. The discal stigma of the fore wings of the male is roundish triangular, quite as broad as long, and is situated at the upper outer corner of the cell, half within it and half beyond; it does not (as in Thecla) disturb the direction of the subcostal nervules, but the transverse basal portion of the lowest inferior subcostal nervule, closing the upper half of the cell, and directly upon which the stigma is situated, is rendered subobsolete thereby. The shape of the wings is much as in Thecla, but they are somewhat more elegant and angular, and are brilliantly colored with metallic tints; third superior subcostal nervule of fore wings arising a short distance before the tip of the cell; fore and middle tibiae of equal length, and slightly more than three-fourths the length of the hind tibiae.

230. **M-album** *Boisd.-Le C.*, Lép. Am. Sept., 86–7, pl. 26, figs. 1–5 (*Thecla*).
Psyche Boisd.-Le C., Lép. Am. Sept., 88–9, pl. 27, figs. 1–5 (*Thecla*).
Gulf States (Mexico, Guatemala).

Food-plants: *Astragalus canadensis, A. glaber, Quercus.*

15. ATLIDES *Hübn.* (1816).

Type: Papilio Halesus *Cram.*

231. **Halesus** *Cram.*, Pap. Exot., 2, 3–4, pl. 98, figs. B, C (*Papilio*); Fabr., Ent. Syst., 3, 1, 273 (*Hesperia*); God., Encycl. Méth., 9, 626 (*Polyommatus*); Boisd.-Le C., Lép. Am. Sept., 83–5, pl. 25, fig. 1–5 (*Thecla*); Butl., Cat. Fabr. Lep., 197 (*Atlides*); Keferst., Zeitschr. ges. Naturw., 44, 227 (*Myrina?*).
Dolichos Hübn., Zutr. Exot. Schmett., 2, 9, figs. 219–20 (*Atlides*).
Dolichus Hübn., Verz. Schmett., 80 (*Atlides*).
Juanita Scudd., Proc. Bost. Soc. Nat. Hist., 11, 435–6 (*Thecla*).
Gulf States, California (Mexico).

Food-plants: *Quercus cinerea, Q. Phellos, Loxanthus.*

16. HYPAUROTIS *Scudder.*

Type: Thecla Chrysalus *Edw.*

This genus is closely allied to the European Aurotis *Dalm.*, but is peculiar for the striking form of the hind wing, the hind border of which has a square angular cut on the upper half, its angle at the tip of the middle subcostal nervule, and just before the middle median nervule an abrupt square excision; the tail of the lower median nervule is long and thread-like. The antennae are less than half as long as the fore wing, being equal in length to

its cell; the club is slender, cylindrical, and about one-fourth as long as the stalk. The legs are very short and slender, the fore tibiae scarcely shorter than the middle, and four-fifths the length of the hind tibiae. There is no discal stigma on the fore wings of the male.

232. Chrysalus *Edw.*, Trans. Am. Ent. Soc., 4, 344-5 (*Thecla*).

Lake Paso and Garden of the Gods, Colorado; Summit Cañon, Mount Nebo, Utah.

17. HABRODAIS *Scudder.*

Type: Thecla Grunus *Boisd.*

This genus is closely allied to Aurotis, having the third superior subcostal nervule forked, as in that genus, and in contrast to the simple condition of the nervule in all our other Ephori. From Aurotis it may readily be distinguished by having a short triangular projection on the hind wings, instead of a long, threadlike tail; the outer border of the fore wings is also much straighter, less rounded, and there is no excision of the inner border of the hind wing near its extremity; the outer border of the same wings is also more produced in the subcostal area; the antennae are more than half as long as the fore wings, and have a rather long, slender, cylindrical and nearly equal club. But the genus is peculiar for the unusual development of the fore tarsal joints of the male, which are enlarged, compacted together, and strongly compressed, together considerably shorter than the tibiae, which in their turn are but little shorter than the hind tibiae.

233. Grunus *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 289 (*Thecla*); Hewits., Ill. Diurn. Lep. 67, Suppl. 16, pl. 6, fig. 18-19 (*Dipsas*).

Mountains of California; Yosemite Valley.

NOTE.—*Lampides Balliston* Hübn., Zutr. Exot. Schmett., 2, 11, figs. 229-30, given by Hübner as "aus Georgien in Florida," probably belongs to the Ephori, but can scarcely be a North American insect.

III. Tribe: ADOLESCENTES *Hübn.* (1816).

[Papiliones polyophthalmi Wien. Verz., 1775; Cives (pars) *Herbst*, 1798; Lycaenides *Kirb.*, 1858; Lycaeninae (pars) *Butl.*, 1869.]

18. EVERES *Hübner* (1816).

Type: Papilio Amyntas *Fabr.*

234. Tejua *Reak.*, Proc. Acad. Nat. Sc. Phil., 1866, 245 (*Lycaena*); Kirb., Syn. Cat. Lep., 356 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop. Het., 82, pl. 10, figs. 3, 3 (*Lycaena*).

Southern California.

Can this possibly be *Papilio Idmon* Hübn., Eur. Schmett., 820-21, of unknown locality, not credited by Staudinger to Europe?

235. **Monica** *Reak.*, Proc. Acad. Nat. Sc., Phil., 1866, 244–5 (*Lycaena*); Kirb., Syn. Cat. Lep., 356 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 82, pl. 10, figs. 18, 18 (*Lycaena*).

Southern California.

236. **Amyntula** Boisd., Ann. Soc. Ent. Fr. [2], 10, 294 (*Lycaena*); Morr., Cat. Lep., N. Am., 12 (*Polyommatus*); Streck., Lep. Rhop.–Het., 82 (*Lycaena*).

Comyntas var. *amyntula* Kirb., Syn. Cat. Lep., 356 (*Cupido*); Ib., ib., 653 (*Plebeius*).

California.

237. **Comyntas** *God.*, Encycl. Méth., 9, 660 (*Polyommatus*); Boisd.–Le C., Lép. Am. Sept., 120–21, pl. 36, figs. 6–9 (*Argus*); Doubl., List. Lep. Brit. Mus., 2, 43–4 (*Lycaena*); Kirb., Syn. Cat. Lep., 356 (*Cupido*); Ib., ib., 653 (*Plebeius*); Scudd., Syst. Rev., 35 (*Everes*); Streck., Lep. Rhop.–Het., 82 (*Lycaena*).

Canada, Saskatchewan and British Columbia southward through Arizona and all parts of United States east of Rocky Mountains to the Gulf of Mexico, (Honduras and Nicaragua.)

Food-plants: *Lespedeza capitata, Phaseolus perennis, Galactia.*

19. CYANIRIS *Dalman* (1816).

Type: Papilio Argiolus *Linn.*

238. **Piasus** *Boisd.*, Ann., Soc. Ent. Fr. [2], 10, 299 (*Lycaena*); Morr., Cat. Lep. N. Am., 12 (*Polyommatus*); Kirb., Syn. Cat. Lep., 363 (*Cupido*); Ib., ib., 653 (*Plebeius*).

California.

Food-plant: *Pavia.*

Provisionally I place this apart from the species with which it has usually been associated, because the heaviness of the markings, as represented by a large mutilated specimen in my cabinet, is very different from what obtains in our wider spread Pseudargiolus, to which Echo must be referred.

239. **Pseudargiolus** *Boisd.–Le C.* (*Argus*); Doubl., List. Lep. Brit. Mus., 2, 45 (*Lycaena*); Gosse, Alab., 144 (*Polyommatus*); pars Streck., Lep. Rhop.–Het., 82 (*Lycaena*).

VIOLACEA Edw., Proc. Ent. Soc., Phil., 6, 201–4 (*Lycaena*); Ib., Butt. N. Am., 1, 147–8, pl. 49, figs. 1–4 (*Lycaena*); Kirb., Syn. Cat. Lep., 368 (*Cupido*); Ib., ib., 653 (*Plebeius*); Scudd., Syst. Rev., 34 (*Cyaniris*) [Vernal form].

Pseudargiolus Boisd.–Le C., Lép. Am. Sept., 118–9, pl. 36, figs. 1–5 (*Argus*).

Lucia pars Streck. (nec Kirb.), Lep. Rhop.–Het., 82–3 (*Lycaena*)

Echo Edw., Proc. Ent. Soc., Phil., 2, 506–7 (*Lycaena*) [Aestival form].
Pseudargiolus Boisd., Ann. Soc. Ent. Fr. [2], 10, 300 (*Lycaena*); Edw. (nec Boisd.–Le C.); Proc. Ent. Soc. Phil., 6, 204–6 (*Lycaena*); Ib., Butt. N. Am., 1, 151–3, pl. 50, figs. 1–3 (*Lycaena*).
Argiolus Sm.–Abb. (nec Linn.); Lep. Ins. Georg., 29–30, pl. 15 (*Papilio*).
Piasus pars Edw. (nec Boisd.?); Syn. N. A. Butt., 37 (*Lycaena*); pars Streck., Lep. Rhop.–Het., 82 (*Lycaena*).

United States east of the Mississippi valley, Canada; northwestern States and Kansas to California.

Food-plants: *Actinomeris squarrosa, A. helianthoides, Apios tuberosa, Erythrina herbacea, Ilex.*

The form violacea of Edwards seems clearly to be the one described and figured by Boisduval and Le Conte, under the name of Pseudargiolus. North of the southern boundary of New York, the female is always blue.

240. **neglecta** *Edw.*, Proc. Acad. Nat. Sc. Phil., 1862, 56 (*Lycaena*); Ib., Butt. N. Am., 1, 153–4, pl. 50, figs. 4–5 (*Lycaena*); Kirb., Syn. Cat. Lep., 371 (*Cupido*); Ib., ib., 653 (*Plebeius*); Scudd., Syst. Rev., 34 (*Cyaniris*).
Argiolus Harr. (nec Linn.), Hitchc., Rep., 1st Ed., 590 (*Polyommatus*).
Pseudargiolus D'Urban, Can. Nat. 5, 246 (*Polyommatus*); (pars) Streck., Lep. Rhop.–Het., 82 (*Lycaena*).
Deutargiolus Harr., MSS., Harr. Ent. Cor., 165 (*Polyommatus*).

Middle, New England and Northwestern States and Canada by way of Winnipeg and British Columbia to California, and by way of Colorado to Texas.

Food-plants: *Spiraea salicifolia, Ceanothus americanus Cornus*, (willow in confinement),

I have placed this and the following species apart from each other, and from pseudargiolus; yet I cannot help sharing a common opinion (to which Mr. Edwards' experiments have given birth) that we shall not be sure of our ground until the complete history of every form is known. See Can. Ent. 8, 61–6.

241. **Lucia** *Kirb.*, Faun. Bor. Am. 4, 299–300, pl. 3, figs. 8–9 (*Polyommatus*); Doubl., List Lep. Brit. Mus. 2, 45 (*Lycaena*); Kirb., Syn. Cat. Lep., 368 (*Cupido*); Ib., ib., 653 (*Plebeius*); Scudd., Syst. Rev., 34 (*Cyaniris*); Streck., Lep. Rhop.–Het., 82–3 (*Lycaena*).

Southern Labrador, Eastern British Provinces, Canada, New England, and Catskills westward to Hudson Bay, Saskatchewan, and Colorado.

Food-plants: *Rhammus catharticus* (sparingly in confinement).

20. PHAEDROTES *Scudder.*

Type: Lycaena Catalina *Reak.*

This genus is very closely allied to Cyaniris, though its general appearance is very distinct. The club of the antennae is somewhat slenderer. The fore tibiae are four-fifths, and the middle tibiae five-sixths the length of the hind tibiae. First superior subcostal nervule of fore wings arising at scarcely three-

fifths the distance from the base to the apex of the cell; the second at the middle of the outer half of the cell, the latter scarcely less than half as long as the wing. The upper surface of the wings have a rather broad brown bordering, broadest in the female, somewhat resembling Cupido in this respect; on the under surface the spots have nearly the same position as in Cyaniris, but on the fore wings are round at ocelli instead of oblique bars, and the space between the extramesial and submarginal markings of the hind wings, is paler than the rest of the surface, producing somewhat the appearance seen in suffused varieties of Cyaniris.

242. sagittigera *Feld.*, Novara. Exp. Zool., 2, 2, 281–2, pl. 35, figs. 20–1 (*Lycaena*); Kirb., Syn. Cat. Lep., 354 (*Cupido*); Ib., ib., 653 (*Plebeius*).

Catalina Reak., Proc. Acad. Nat. Sc. Phil., 1866, 244 (*Lycaena*); Streck., Lep. Rhop.–Het., 86, 120, pl. 10, figs. 1, 1, 2 (*Lycaena*).

Lorquini Behr, Proc. Cal. Acad. Nat. Sc., 3, 280 (*Lycaena*); Streck., Lep. Rhop.–Het., 90 (*Lycaena*).

Rhaca Boisd., Ann. Soc. Ent. Belg., 12, 51 (*Lycaena*); Streck., Lep. Rhop.–Het., 88 (*Lycaena*).

Viaca Edw., Trans. Ann. Ent. Soc., 3, 209 (*Lycaena*); Streck., Lep. Rhop.–Het., 89–90 (*Lycaena*).

Daunia Edw., Trans. Am. Ent. Soc., 3, 272 (*Lycaena*).

Southern and Middle California, Sierra Nevada, Colorado (Sonora).

18. PHILOTES *Scudder.*

Type: Lycaena regia *Boisd.*

This exquisite group of Blues, by far the most brilliant of our North American forms, presents, in the markings of the under surface (as Felder has already observed) a certain resemblance to the preceding genus, to which, also, it is allied by structure. The antennae have much the same form, though the club is slightly shorter; the palpi are long, slender, and rather densely clothed beneath. The hind wings are longer than in Phaedrotes, and the cell of the fore wings is distinctly more than half the length of the wing. The legs are proportionally much shorter than in Phaedrotes, and the middle tibiae much larger in proportion to the tarsi than in that genus; the fore tibiae are little more than four-fifths, and the middle tibiae nine-tenths as long as the hind tibiae; the femora are densely clothed with long spreading hairs.

243. sonorensis *Feld.*, Novara. Exp. Zool., 2, 2, 281, pl. 35, figs. 3–4 (*Lycaena*); Kirb., Syn. Cat. Lep., 354 (*Cupido*); Ib., ib., 653 (*Plebeius*).

Southern California? (Sonora).

244. regia *Boisd.*, Ann. Soc. Ent. Belg., 12, 46 (*Lycaena*); Kirb., Syn. Cat. Lep., 366 (*Cupido*); Ib., ib., 653 (*Plebeius*); Keferst., Zeitschr. Ges. Naturw., 44, 228 (*Cigaritis?*); Edw., Butt. N. Am. 2, pl. Lyc. 1, figs. 1–4 (*Lycaena*); Streck., Lep. Rhop.–Het., 87 (*Lycaena*).

Southern and Central California.

This species is very closely allied to the preceding, and may prove to be identical with it.

22. NOMIADES *Hübn.* (1816).

Type: Papilio Semiargus *Rott.*

245. Behrii *Edw.*, Proc. Acad. Nat. Sc. Phil., 1862, 224 (*Lycaena*); Kirb., (pars) Syn. Cat. Lep. 400 (*Thecla*); Scudd., Can. Ent. 8, 23–4 (*Nomiades*).
Polyphemus Boisd., Ann. Soc. Ent. Belg., 12, 49 (*Lycaena*).
Southern (and Central?) California.

246. Oro *Scudd.*, Can. Ent., 8, 23 (*Nomiades*).
Colorado.

247. Lygdamus *Doubl.*, Entom., 209–11 (*Polyommatus*); Morr., Cat. Lep. N. Am., 12 (*Thecla*); Kirb., Syn. Cat. Lep., 368 (*Cupido*); Ib., ib., 653 (*Plebeius*); Scudd., Syst. Rev., 33 (*Glaucopsyche*); Ib., Can. Ent., 8, 23 (*Nomiades*); Streck., Lep. Rhop.–Het., 84 (*Lycaena*).
Lygdamas Edw., Butt. N. Am., 1, 148–9, pl. 49, figs. 5–7 (*Lycaena*).
Atlantic States from upper Susquehanna to Georgia, Ohio, Michigan.

248. Couperi *Grote*, Bul. Buf. Soc. Nat. Sci., 1, 185 (*Glaucopsyche*); Scudd., Can. Ent., 8, 22–3 (*Nomiades*).
Pembina Edw., Syn. N. Am. Butt., 37 (nec Proc. Acad. Phil.) (*Lycaena*); Kirb., Syn. Cat. Lep., 401 (*Thecla*); Streck., Lep. Rhop.–Het., 69, 84, pl. 10, figs. 10, 10, 11 (*Lycaena*); Scudd., Syst. Rev., 34 (*Glaucopsyche*).
Lygdamus Doubl., List. Lep. Brit. Mus. (nec Entom.), 2, 45 (*Lycaena*).
Southern British America from Southern Labrador and Anticosti to Lake Winnipeg and the Saskatchewan.
Food-plant: *Vicia cracca?*

The specimens "from the west and northwest," described by Strecker (loc. cit., 69), as probably belonging to Pembina, appear to be Antiacis *Boisd.*, but the description is insufficient to determine.

249. Antiacis *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 300 (*Lycaena*); Morr., Cat. Lep. N. Am., 12 (*Polyommatus*); Kirb., Syn. Cat. Lep., 373 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 84 (*Lycaena*); Scudd., Can. Ent., 8, 22 (*Nomiades*).
Mertila Edw., Proc. Ent. Soc. Phil., 6, 206 (*Lycaena*); Streck., Lep. Rhop.–Het., 85 (*Lycaena*).
California, British Columbia?
Food-plant: *Lupinus.*

250. Xerces *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 296 (*Lycaena*); Morr., Cat. Lep. N. Am., 12 (*Polyommatus*); Kirb., Syn. Cat. Lep., 373 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 86 (*Lycaena*); Scudd., Can. Ent., 8, 21–2 (*Nomiades.*)
Xerxes Edw., Syn. N. Am. Butt., 35 (*Lycaena*).
California.
Food-plant: *Lupinus.*

23. CUPIDO *Schrank* (1801).

Type: Papilio Arion *Linn.*

Division 1.

251. ***Orcus** *Edw.*, Trans. Am. Ent. Soc., 2, 376 (*Lycaena*); Kirb., Syn. Cat. Lep., 377 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck. Lep. Rhop.–Het., 85 (*Lycaena*).

California.

252. ***Ardea** *Edw.*, Trans. Am. Ent. Soc., 3, 209–10 (*Lycaena*); Streck., Lep. Rhop.–Het., 86 (*Lycaena*).

Nevada.

This was apparently described from a single male, and will very likely prove only an extraordinary special variation of *C. Pheres.*

253. **Pheres** *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 297 (*Lycaena*); Morr., Cat. Lep. N. Am., 12 (*Polyommatus*); Kirb., Syn. Cat. Lep., 362 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 85–6, 120 (*Lycaena*).

Evius Boisd., Ann. Soc. Ent. Belg., 12, 49 (*Lycaena*); Streck., Lep. Rhop.–Het., 89 (*Lycaena*).

California, British Columbia.

See the note under *C. Fulla.*

254. **Phileros** *Boisd.*, Ann. Soc. Ent. Belg., 12, 50 (*Lycaena*); Kirb., Syn. Cat. Lep., 366 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 87 (*Lycaena*).

Helios Edw., Trans. Am. Ent. Soc., 3, 208–9 (*Lycaena*); Streck., Lep. Rhop.–Het., 89 (*Lycaena*).

California, Sierra Nevada.

This species is exceedingly close to Pheres, but appears to be distinct. See also the note under the next species.

255. **Fulla** *Edw.*, Trans. Am. Ent. Soc., 3, 194–5 (*Lycaena*); Kirb., Syn. Cat. Lep., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 89 (*Lycaena*).

fuliginosa Streck (nec Edw.), Lep. Rhop.–Het., 89 (*Lycaena*).

California, Sierra Nevada.

The synonomy of some of the species of Cupido appears to me rather confused; especially is the position doubtful of the forms described by Boisduval under the names Phileros and Evius. I have followed Mr. W. H. Edwards, since he has examined Boisduval's types and kindly communicated to me the results. He says that Evius is "the Nevada form of Pheres". I have not seen any Pheres from Nevada and therefore can hold no opinion on that subject, but Evius was described from Southern California, and the description accords perfectly (as far as it goes) with either Helios or Fulla. As Phileros (which has seemed to me Icarioides) is stated by Mr. Edwards to be Helios, it is hardly likely that Evius, described at the same time, can be the same. The types of Fulla have been lost, and perhaps had Mr. Edwards had them by him when examining Boisduval's types, he might have considered Evius as that species.

256. Sacpiolus *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 296 (*Lycaena*); Morr., Cat. Lep. N. Am., 12 (*Polyommatus*); Kirb., Syn. Cat. Lep., 373 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 90 (*Lycaena*).

California, Colorado.

257. Icarioides *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 297 (*Lycaena*); Morr., Cat. Lep. N. Am. 12 (*Polyommatus*); Kirb., Syn. Cat. Lep., 366 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 87, 120 (*Lycaena*).

Daedalus Behr, Proc. Calif. Acad. Nat. Sc., 3, 280 (*Lycaena*); Streck., Lep. Rhop.–Het., 90 (*Lycaena*).

Highlands of California.

See the note under *C. Fulla*.

258. Pembina *Edw.*, Proc. Acad. Nat. Sc. Philad., 1862, 224 (*Lycaena*); Kirb., Syn. Cat. Lep., 401 (*Thecla*).

Lycea Edw., Proc. Ent. Soc. Phil[illegible]d., 2, 507 (*Lycaena*); Streck., Lep. Rhop.–Het., 88 (*Lycaena*); Kirb, Syn. Cat. Lep., 377 (*Cupido*); Ib., ib., 653 (*Plebeius*).

Rapahoe Reak., Proc. Ent. Soc. Philad., 6, 146–7 (*Lycaena*); Streck., Lep. Rhop.–Het., 87, 120, pl. 10, figs. 14, 14, 15 (*Lycaena*).

Lake Winnipeg to Colorado.

259. Maricopa *Reak.*, Proc. Acad. Nat. Sc. Phil., 1866, 245–6 (*Lycaena*); Kirb., Syn. Cat. Lep., 377 (*Cupido*); Ib., ib., 653 (*Plebius*); Streck., Lep. Rhop.–Het., 85 (*Lycaena*).

?pardalis ♂ (nec ♀) Behr, Proc. Cal. Acad. Nat. Sc., 3, 279–80 (*Lycaena*).

Behrii Streck. (nec Edw.), Lep. Rhop.–Het., 84–5 (*Lycaena*).

California.

I have placed the male of Behr's pardalis in this place on the strength of a specimen labeled in Dr. Behr's writing, which Mr. W. H. Edwards has sent me, and in which the under surface is much paler than in the true Pardalis. It is possible that this is a subsequent determination of Dr. Behr, for both he and Boisduval describe the under surface as alike in the two sexes.

260. Mintha *Edw.*, Trans. Am. Ent. Soc. 3, 194 (*Lycaena*); Streck., Lep. Rhop.–Het., 89 (*Lycaena*).

Mincha Kirb., Syn. Cat. Lep. 653 (*Plebeius*).

Nevada, California.

261. Pardalis *Behr*, Proc. Calif. Acad. Sc., 3, 279–80 (♀ nec ♂ ?); (*Lycaena*); Kirb., Syn. Cat. Lep., 374 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 89 (*Lycaena*).

Erymus Boisd., Ann. Soc. Ent. Belg., 12, 48–9 (*Lycaena*); Streck., Lep. Rhop.–Het., 86 (*Lycaena*).

California, Oregon.

262. *Kodiak *Edw.*, Trans. Am. Ent. Soc., 3, 20 (*Lycaena*); Kirb., Syn. Cat. Lep., 376 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.-Het., 87 (*Lycaena*).

Optilete Streck. (nec Knoch ?), Rhop.-Het., 120.

Alaskan Islands.

Division 2.

263. **heteronea** *Boisd.*, Ann., Soc. Ent. Fr. [2], 10, 298 (*Lycaena*); Morr., Cat. Lep. N. Am. 12 (*Polyommatus*); Kirb., Syn. Cat. Lep. 363 (*Cupido*); Ib., ib., 653 (*Plebeius*); Edw., Butt. N. Am., 2, pl. Lyc. 1, figs. 5–8 (*Lycaena*); Streck. Lep. Rhop.-Het., 92, pl. 10, figs. 6, 6, 7 (*Lycaena*).

California, Sierra Nevada, Utah.

Food-plant: *Eriogonum.*

24. AGRIADES *Hübner* (1816).

Type: Papilio Orbitulus *Prunn.*

264. **Aquilo** *Boisd.*, Icon. Lep., 1, 62–3, pl. 12. figs. 7–8 (*Argus*); Herr.-Schaeff., Schmett. Eur., 1, 122 (*Lycaena*); Scudd., Proc. Bost. Soc. Nat. Hist., 17, 310–14 (*Agriades*); Streck., Lep. Rhop.-Het., 86–7 (*Lycaena*).

Franklinii Curt., Ross Sec. Voy. App., 69–70, pl. A, fig. 8–9 (*Polyommatus*).

Orbitulus var. C, Kirb., Syn. Cat. Lep., 363 (*Cupido*); Ib., ib., 653 (*Plebeius*).

Labrador, from the Straits of Belle Isle Northward, Prince Rupert's Land; Arctic Coast at mouth of McKenzie's River.

I formerly expressed doubts whether Franklinii should be referred to this species; but these have now been removed by the examination of a considerable series of this and allied species.

265. **Podarce** *Feld.*, Novara-Exp. Zool., 2, 2, 282–3, pl. 35, figs. 22–3 (*Lycaena*); Kirb., Syn. Cat. Lep., 363 (*Cupido*); Ib., ib., 653 (*Plebeius*).

Tehama Reak., Proc. Acad. Nat. Sc. Phil., 1866, 246 (*Lycaena*).

Cilla Behr. Proc. Calif. Acad. Nat. Sc., 3, 281 (*Lycaena*).

Nestos Boisd., Ann. Soc. Ent. Belg., 12, 50 (*Lycaena*); Streck., Lep. Rhop.-Het., 87 (*Lycaena*).

Orbitulus Streck., (nec Prunn.) Lep. Rhop.-Het., 86, pl. 10, figs. 15, 16 (*Lycaena*).

High mountains of California, Oregon, Nevada and Colorado.

It is possible that Felder's Podarce must be referred to Orbitulus, in which case the name Tehama must be retained for this species.

266. **Orbitulus** *Prunn.*, Lep. Ped., 75 (*Papilio*); Hübn., Verz.-Schmett., 68 (*Agriades*); God., Encycl. Méth., 9, 688 (*Polyommatus*); Doubl., List Lep. Brit. Mus. 2, 49 (*Lycaena*); (pars) Kirb., Syn., Cat. Lep., 363 (*Cupido*); Ib., ib., 653 (*Plebeius*); (pars) Streck., Lep. Rhop.-Het., 86 (*Lycaena*).

Meleager Hübn., Eur. Schmett., 1, pl. 103, figs. 522–5, pl. 151, figs. 761–2 (*Papilio*).

rustica Edw., Proc. Ent. Soc. Phil., 4, 203–4 (*Lycaena*).

? *Amica* Edw., Proc. Ent. Soc. Phil., 2, 80–81 (*Lycaena*) Streck., Rhop.-Het., 85 (*Lycaena*).

Rocky Mountains, from Colorado northward.

The description of Amica *Edw.* is insufficient to refer it positively to this species; but it will probably be found to be the same. It may perhaps be long to Aquilo.

25. RUSTICUS *Hübner*, (1806).

Type: Papilio Argus *Linn.*

267. **lupini** *Boisd.*, Ann. Soc. Ent. Belg., 12, 46–7 (*Lycaena*); Kirb., Syn. Cat. Lep., 358 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.-Het., 88 (*Lycaena*).

Minnehaha Scudd., Proc. Bost. Soc. Nat. Hist., 17, 88–9 (*Agriades*).

Southern California, Yosemite Valley, Upper Yellowstone.

Food-plant: *Lupinus.*

Minnehaha was improperly compared by me with Reakirt's Maricopa, to which it is not closely allied. It differs slightly from specimens I have seen of Boisduval's lupini, but it is probably not distinct.

268. **Shasta** *Edw.*, Proc. Acad. Nat. Sc. Phil., 1862, 224–5 (*Lycaena*); Kirb., Syn. Cat. Lep. 401 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.-Het., 83 (*Lycaena*).

Zelmira Feld., Novara-Ex. Zool., 2, 2, 282, pl. 35, figs. 17–19 (*Lycaena*).

Calchas Behr. Proc. Calif. Acad. Nat. Sc. 3, 281–2 (*Lycaena*); Streck., Lep. Rhop.-Het., 88 (*Lycaena*).

nivium Boisd., Ann. Soc. Ent. Belg., 12, 47 (*Lycaena*).

Oregon, California, Nevada, Utah.

The only difficulty in referring to Shasta the species of Felder, Behr and Boisduval (which are undoubtedly the same) is that Edwards describes his female as "clear brown" above, with no reference to any basal suffusion with blue.

269. **Achaja** *Behr*, Proc. Cal. Acad. Sc., 3, 280–1 (*Lycaena*).

Achaja Kirb., Syn. Cat. Lep., 366 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.-Het., 89 (*Lycaena*).

rufescens Boisd., Ann. Soc. Ent. Belg., 12, 48 (*Lycaena*).

Central California.

270. **Enoptes** *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 298–9 (*Lycaena*); Morr., Cat. Lep. N. Am. 12 (*Polyommatus*); Kirb., Syn. Cat. Lep. 363 (*Cupido*); Ib., ib., 653 (*Plebeius*) Streck., Lep. Rhop.–Het., 89 (*Lycaena*).

California, Sierra, Nevada, Arizona.

271. **Battoides** *Behr*, Proc. Calif. Acad. Nat. Sc., 3, 282 (*Lycaena*); Kirb., Syn. Cat. Lep., 360 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 87 (*Lycaena*).

Glaucon Edw., Trans. Am. Ent. Soc., 3, 210 (*Lycaena*); Streck., Lep. Rhop.–Het., 88 (*Lycaena*).

Highlands of California, Nevada and Colorado.

272. **Melissa** *Edw.*, Trans. Am. Ent. Soc., 4, 346–8 (*Lycaena*); Streck., Lep. Rhop.–Het., 88, pl. 10, figs. 8, 8, 9 (*Lycaena*).

Anna Scudd. (nec Edw.), Proc. Bost. Soc. Nat. Hist., 17, 88 (*Lycaeides*).

Nevada, Arizona, Colorado and upper Yellowstone.

273. **Acmon** *Westw.–Hewits.*, Gen. Diurn. Lep., 2, 494, pl. 76, fig. 2 (*Lycaena*); Morr., Cat. Lep. N. Am., 12 (*Polyommatus*); Kirb., Syn. Cat. Lep., 358 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 88 (*Lycaena*).

Antaegon Boisd., Ann. Soc. Ent. Fr. [2], 10, 295 (*Lycaena*).

Actaegon Morr., Cat. Lep. N. Am., 12 (*Polyommatus*).

California to Colorado.

Food-plant: *Hosackia.*

274. **Scudderii** *Edw.*, Proc. Acad. Nat. Sc. Philad., 1861, 164 (*Lacaena*) Kirb., Syn. Cat. Lep., 358 (*Cupido*); Ib., ib., 653 (*Plebeius*); Scudd., Syst. Rev., 33 (*Lycaeides*); Ib., Proc. Bost. Soc. Nat. Hist., 18, 188–9 (*Rusticus*); Streck., Lep. Rhop.–Het., 87 (*Lycaena*).

Central New York, Southern Ontario and Michigan, northward to Southern Labrador, Saskatchewan and McKenzie's Rivers.

Food-plant: *Lupinus perennis.*

275. **Anna** *Edw.*, Proc. Acad. Nat. Sc. Phil., 1861, 163 (*Lycaena*); Kirb., Syn. Cat. Lep., 358 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck. Lep. Rhop.–Het., 88, p. 10, figs. 4, 4, 5 (*Lycaena*).

Cajona Reak., Proc. Ent. Soc., Phil., 6, 26–7 (*Lycaena*).

Argyrotoxus Behr (nec Bergstr.), Proc. Calif. Acad. Nat. Sc., 3, 281 (*Lycaena*).

Philemon Boisd., Ann. Soc. Ent. Belg., 12, 47–8 (*Lycaena*).

California, Nevada, Utah, Colorado.

26. HEMIARGUS *Hübner* (1816).

Type: Rusticus adolescens Hanno *Hübn.*

276. **Ammon** *Lef.*, Sagra Hist. Cuba, 612, pl. 16, figs. 7, 7 a–b (*Lycaena*); Kirb., Syn. Cat. Lep., 351 (*Cupido*); Ib., ib., 653 (*Plebeius*).

Florida Keys (Cuba).

277. **Antibubastus** *Hübn.*, Zutr. Exot. Schmett., 1, 19–20, figs. 99–100 (*Hemiargus*); Westw.–Hewits., Gen. Diurn. Lep., 2, 486 (*Thecla*); Morr., Cat. Lep. N. A., 12 (*Polyommatus*); Kirb., Syn. Cat. Lep., 350 (*Cupido*); Ib., ib., 653 (*Plebeius*).

Bubastus Hübn. (nec Cram.), Prospectus, 5 (*Rusticus*).

Hanno Hübn. (nec Stoll'), Samml. Exot. Schmett., 1 (*Rusticus adolescens*); Ib., Index, 3 (*Hemiargus*); Streck. Lep. Rhop.–Het., 83 (*Lycaena*).

Hamo Luc., Sagra Hist. Cuba, 612–3 (*Lycaena*).

Filenus Poey, Cent. Lép. Cuba, 2 (*Polyommatus*); Boisd.–Le C., Lép. Am. Sept., 114–7 (*Argus*).

Pseudoptiletes Boisd.–Le C., Lép. Am. Sept., pl. 35, figs. 5–7 (*Argus*).

Astenidas Boisd. MS., Lucas Sagra Cuba, 613 (*Lycaena*).

Colorado and Gulf States (to the Antilles and Panama).

278. **Isola** *Reak.*, Proc. Acad. Nat. Sc. Phil., 1866, 332 (*Lycaena*); Kirb., Syn. Cat. Lep., 376 (*Cupido*); Ib., ib., 653 (*Plebeius*); Streck., Lep. Rhop.–Het., 84 (*Lycaena*).

Gyas Edw., Trans. Am. Ent. Soc., 3, 210–11 (*Lycaena*); Streck., Lep. Rhop.–Het., 84 (*Lycaena*).

Alce Edw., Trans. Am. Ent. Soc., 3, 272–3 (*Lycaena*); Streck., Lep. Rhop.–Het., 88 (*Lycaena*).

Arizona, Colorado, Kansas, Texas (to Guatemala and Panama).

27. BREPHIDIUM *Scudder.*

Type: Lycaena exilis *Boisd.*

This charming group of the tiniest of butterflies is not far removed from the preceding, but is somewhat remarkable for the length of the antennae, which are noticeably more than half as long as the elongated fore wings, and have a heavy though elongated club; the palpi are not long, and are rather heavily beset beneath with long hairs; the eyes are naked. The fore wings are unusually elongated, produced, though not at all pointed, at the apex, the costal being half as long again as the inner margin, while in its nearest N. American ally, Hemiargus, it is only two-fifths longer; in contrast with this the hind wings are comparatively short in this genus, being but two-thirds the length of the fore wings, while in Hemiargus they are nearly three-quarters the length of the front pair; the cell of the fore wings is also less than half as long as the wing, so that the parts beyond it are unusually extended.

279. **isophthalma** *Herr.–Schaeff.*, Corr.–Blatt. Zool. Min. Gesellsch. Regensb., 1862, 141–2 (*Lycaena*); Kirb., Syn. Cat. Lep., 350 (*Cupido*); Ib., ib., 653 (*Plebeius*).

pseudofea Morr., Bul. Buf. Soc. Nat. Sci., 1, 186–7 (*Lycaena*).

Florida (Cuba).

280. **Fea** *Edw.*, Trans. Am. Ent. Soc, 3, 211 (*Lycaena*).

exilis pars Streck. (nec Edw.), Lep. Rhop.–Het., 83 (*Lacaena*).

Texas.

281. **exile** *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 294 (*Lycaena*); Kirb., Syn. Cat. Lep., 357 (*Cupido*); Ib., ib., 653 (*Plebeius*); pars Streck., Lep. Rhop.–Hel., 83 (*Lycaena*).

California, Nevada, Arizona (Mexico).

28. LEPTOTES *Scudder.*

Type: Lycaena Theonus *Lef.*

A group of very delicate winged, tropical butterflies, whose wings are completely covered with markings; allied to the tailed Lampides. The antennae are exceedingly slender, but have a large, elongated, subcylindrical club, long and slender palpi with terminal joint longer than in our other genera, the fore wings proportionally long, though not to so great an extent as in Brephidium. The cell of the fore wings is more than half as long as the wing; first superior subcostal nervule arising somewhat beyond the middle of the wing. Legs very slender and considerably shorter than usual; fore and middle tibiae of equal length and four-fifths as long as the hind tibiae.

282. **marina** *Reak.*, Proc. Acad. Nat. Sc. Phil., 1868, 87 (*Lycaena*); Kirb., Syn. Cat. Lep. 351 (*Cupido*); Ib., ib., 653 (*Plebeius*).

Cassius (pars) Butl., Proc. Zool. Soc. Lond., 1874, 354 (*Lampides*).

Cassioides Boisd., Lép. Guat., 16 (*Lycaena*).

? Cassidula Boisd., Lép. Guat., 16–17 (*Lycaena*).

Southern California (Mexico and Honduras).

283. **Theonus** *Lef.*, Sagra Hist. Nat. Cuba, An. Art., 611–12, pl. figs. 8, 8 a, b (*Lycaena*); Kirb., Syn. Cat. Lep., 351 (*Cupido*); Ib., ib., 653 (*Plebeius*).

Cassius Herr.–Schaeff. (nec Cram.), Corr.–Blatt. Zool. Min. Ges. Regensb., 1864, 164 (*Lycaena*).

Cassius, var. *Plinius* Butl. (nec Fabr.), Cat. Fabr. Lep. 164 (*Lampides*).

Cassius var. *floridensis* Morr., Bul. Buf. Soc. Nat. Sci., 1, 187–8 (*Lycaena*).

Florida Keys (Cuba).

NOTE.—There are no descriptions corresponding to "Lycaena Clara Edw.," "L. Eunomia Edw." and "L. Embla Edw.," referred to in Kirby's General. Catalogue, pp. 376, 653. These names were sent to Mr. Kirby as about to be published, and by accident were never canceled.

IV. Tribe: VILLICANTES *Hübn.* (1816).

[Papiliones rutili *Wien. Verz.*, 1775; Cives pars *Herbst*, 1798; Polyommatides *Kirb.*, 1858; Lycaeninae pars *Butl.*, 1869.]

29. THARSALEA *Scudder.*

Type: Polyommatus Arota *Boisd.*

This group my be readily distinguished from all other genera of American Villicantes by the pointed tail of the lower median nervule of the hind wings; the Thecloid markings of the under surface of the same wings also give it a peculiar aspect. The middle of the hind border of the hind wings, instead of being full and rounded in the female, as it is in every other North American genus, is rather excised; the cell of the fore wing is more than half as long as the wing. The fore tibiae of the male are seven-eighths, and those of the female more than three-quarters as long as the hind tibiae; the basal joint of middle and hind tarsi is not at all swollen.

284. **virginiensis** *Edw.*, Trans. Am. Ent. Soc., 3, 21–2 (*Chrysophanus*); Kirb. Syn. Cat. Lep., 345 (*Lycaena*); Streck., Lep. Rhop.–Het., 91, pl. 10, figs. 21, 21, 22 (*Lycaena*).
Nevada, Colorado.

285. **Arota** *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 293–4 (*Polyommatus*); Kirb., Syn. Cat. Lep., 343 (*Lycaena*); Streck., Lep. Rhop.–Het., 91, pl. 10, figs. 27, 27, 28 (*Lycaena*).
California.

286. ***Hermes** *Edw.*, Trans. Am. Ent. Soc., 3, 21 (*Chrysophanus*); Kirb., Syn. Cat. Lep., 345 (*Lycaena*); Streck., Lep. Rhop.–Het., 91–2 (*Lycaena*).
California, Nevada.

30. CHALCERIA *Scudder.*

Type: Chrysophanus rubidus *Behr.*

The males of the known species of this genus are remarkable for the warmth of the brazen tint borne by the upper surface of the wings, which are otherwise marked with a narrow dark edging. Most of them also have very light, and all of them roundish ocellate markings on the under surface of the hind wings, recalling the genera Cupido and Nomiades among the Blues. The club of the antennae is rather shorter than in the other genera. The fore tibiae of both sexes are about five-sixths the length of the hind tibiae; the basal tarsal joint of middle and hind legs is not at all swollen. The hind wings are rounded and are nearly alike in the two sexes, recalling, in this respect, the genus Chrysophanus, but the fore wings are rather more pointed than there, and rather approach Gaeides, from which this group differs in the rounded hind wings of the male; the cell is slightly more than half the length of the wing.

287. **cuprea** *Edw.*, Trans. Am. Ent, Soc., 3, 20–1 (*Chrysophanus*); Ib., Butt. N. Am., 2, pl. Chrys. 1, figs. 4–7 (*Chrysophanus*); Kirb., Syn. Cat. Lep., 345 (*Lycaena*); Streck., Lep. Rhop. Het., 92 (*Lycaena*).
Oregon, Sierra Nevada of California.

288. **rubida** *Behr.*, Proc. Ent. Soc. Phil., 6, 208 (*Chrysóphanus*); Kirb., Syn. Cat. Lep., 345 (*Lycaena*); Edw., Butt. N. Am., 2, pl. Chrys. 1, figs. 1–3 (*Chrysophanus*); Streck., Lep. Rhop.–Het., 92 (*Lycaena*).

Oregon, Nevada.

289. **Sirius** *Edw.*, Trans. Am. Ent. Soc., 3, 270 (*Chrysophanus*); Ib., Butt. N. Am., 2, pl. Chrys. 1, figs. 8–10 (*Chrysophanus*); Streck., Lep. Rhop.–Het., 92, pl. 10, figs. 29, 30 (*Lycaena*).

Colorado, Yellowstone.

31. GAEIDES *Scudder.*

Type: Chrysophanus Dione *Scudd.*

This group contains the largest species of the tribe, and is closely related to Chrysophanus, from which it may quickly be distinguished by the entirely unswollen condition of the basal tarsal joint of the middle and hind legs of the male, and by the squarer form of the hind wings of the same sex. The general appearance of the two sexes is usually less diverse than in most of our Villicantes, although in this particular it agrees pretty closely with one of the sections of Epidemia. The fore wings are more pointed than usual, even the females partaking of this character to a certain degree; the cell is but little more than half as long as the fore wing; the markings of the under surface are unusually heavy, and the posterior border of the hind wings always has a greater or less number of orange lunules. The fore tibiae of the male are about three-fourths, and of the female about two-thirds the length of the hind tibiae.

Division 1.

290. **Dione** *Scudd.*, Trans. Chic. Acad. Sc., 1, 330 (*Chrysophanus*); Kirb., Syn. Cat. Lep., 343 (*Lycaena*); Streck., Lep. Rhop.–Het., 92 (*Lycaena*).

Iowa, Missouri, Kansas, Nebraska.

291. **xanthoides** *Boisd.*, Ann. Ent. Soc. Fr. [2], 10, 292–3 (*Polyommatus*); Kirb., Syn. Cat. Lep. 343 (*Lycaena*); Streck., Lep. Rhop.–Het., 92, pl. 10, figs. 12, 12, 13 (*Lycaena*).

California.

Food-plant: *Hemizonia.*

Division 2.

292. **Gorgon** *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 292 (*Polyommatus*); Kirb. Syn. Cat. Lep., 343 (*Lycaena*); Streck., Lep. Rhop.–Het., 90, pl. 10, figs. 17, 17 (*Lycaena*).

Southern and Central California.

32. CHRYSOPHANUS *Hübner* (1816).

Type: Papilio Hippothoe *Linn.*

293. Thoe *Boisd.* MS., Gray Griff. Cuv. An. Kingd. Ins., 2, pl. 58, figs. 4, 4 a, b. (*Polyommatus*); Boisd.–Le C., Lép. Am. Sept., 125–6, pl. 38, figs. 1–3 (*Polyommatus*); Westw.–Hewits., Gen. Diurn. Lep., 2, 498 (*Chrysophanus*); Kirb., Syn. Cat. Lep., 343 (*Lycaena*); Streck., Lep. Rhop.–Het., 91 (*Lycaena*).

Hyllus Butl. (nec Cram.), Cat. Fabr. Lep., 173 (*Chrysophanus*).

Newfoundland, New England, New York, Pennsylvania, Canada, Michigan, Minnesota, Kansas, Nebraska.

Food-plant: *Polygonum.*

The true Hyllus seems to me to be an Axiocerces, and its home probably given correctly by Cramer.

33. EPIDEMIA *Scudder.*

Type: Polyommatus Epixanthe *Boisd.–Le C.*

Almost all the smaller species of coppers fall into this genus, which includes also the European Dorilas and Amphidamas. In the former of the two sections into which it is here divided, the basal joint of the middle and hind tarsi are not at all swollen; in the latter section, which includes the European species mentioned, they are swollen to a very slight degree; the species of the first section also have the hind wings of the male more rounded than those of the latter. In all the species the markings of the under surface of the hind wings (which are usually very light) show a tendency to form an extra-mesial series of sub-connected slender lunules, recalling, in *E. Mariposa*, the most extreme case, their appearance in the species of Tharsalea. The antennal club is rather shorter than usual. The fore tibiae of the male are longer than usual, more than equaling the length of the fore tarsi.

Division 1.

294. Mariposa *Reak.*, Proc. Ent. Soc. Phil., 6, 149–50, note (*Polyommatus*); Kirb., Syn. Cat. Lep., 342 (*Lycaena*); Streck., Lep. Rhop.–Het., 91, pl. 10, figs. 25, 25, 26 (*Lycaena*).

nivalis Boisd., Ann. Soc. Ent. Belg., 12, 44–5 (*Polyommatus*).

California.

295. Zeroe *Boisd.*, Ann. Soc. Ent. Belg., 12, 45 (*Polyommatus*).

Ianthe Edw., Trans. Am. Ent. Soc., 3, 211–12 (*Chrysophanus*); Streck., Lep. Rhop.–Het., 91, pl. 10, figs. 23, 23, 24 (*Lycaena*).

Castro pars Edw., (nec Reak.), Syn. N. A. Butt., 32 (*Chrysophanus*).

California, Nevada, Utah, Colorado.

Division 2.

296. **Helloides** *Boisd.*, Ann. Soc. Ent. Fr. [2] 10, 291 (*Polyommatus*); Streck., Lep. Rhop.–Het., 91, pl. 10, figs. 19, 19, 20 (*Lycaena*); Kirb., Syn. Cat. Lep., 342 (*Lycaena*).

Castro Reak., Proc. Ent. Soc. Phil., 6, 148–9 (*Polyommatus*); pars Edw., Syn. N. A. Butt., 32 (*Chrysophanus*).

California, Oregon, Upper Yellowstone, Colorado, Utah.

297. **Dorcas** Kirb., Faun. Bor. Am., 4, 299, pl. 4, fig. 1 (*Lycaena*); Westw.–Hewits., Gen. Diurn. Lep., 498 (*Chrysophanus*); Morr., Cat. Lep. N. Am., 12 (*Polyommatus*).

Anthelle Boisd. MS., Doubl., List Lep. Brit. Mus., 2, 55 (*Polyommatus*).

Epixanthe pars Moschl. (nec Boisd.–Le C.), Stett., Ent. Zeit., 31, 114–15 (*Polyommatus*); pars Streck., Lep. Rhop.–Het., 90 (*Lycaena*).

Southern Labrador, to Lake Winnipeg and the Saskatchewan.

298. **Epixanthe** *Boisd.–Le C.*, Lép. Am. Sept., 127, pl. 39, figs. 4–5 (*Polyommatus*); Westw.–Hewits., Gen. Diurn. Lep. 498 (*Chrysophanus*); Harr., Ins. Inj. Veg., 3d Ed., 274 (*Lycaena*); pars Streck., Lep. Rhop.–Het., 90 (*Lycaena*).

Amicetus Boisd. MS., Doubl., List Brit. Mus., 2, 55 (*Polyommatus*).

Atlantic coast, from Central New England to Pennsylvania; westward by way of Southern Ontario, Southern Michigan, Ohio and Illinois to Wisconsin, Iowa, Kansas and Nebraska.

Food-plant: possibly *Rumex verticillatus*.

34. HEODES *Dalman* (1816).

Type: Papilio Phlaeas *Linn.*

299. **Hypophlaeas** *Boisd.*, Ann. Soc. Ent. Fr. [2], 10, 291 (*Polyommatus*).

Phlaeas pars God. (nec Linn.), Encycl. Méth., 9, 670–71 (*Polyommatus*); Boisd.–Le C., Lép. Am. Sept., 123–4 (*Polyommatus*); pars Westw.–Hewits., Gen. Diurn. Lep., 498 (*Chrysophanus*).

americana Harr., Ins. Inj. Veg., 3d Ed., 273–4, fig. 104 (*Lycaena*).

Phlaeas var. *e. f.*, Kirb., Syn. Cat. Lep., 344 (*Lycaena*).

Phlaeas var. *americana* Streck., Lep. Rhop.–Het., 91 (*Lycaena*).

From Nova Scotia, Northern Ontario, Lake Superior and Wisconsin, southward to about 37 deg. N., and further south in the Appalachian district; Northern California.

Food-plant: *Rumex acetosella*.

In this American species, the prolongation of the lower median nervule of the hind wings into a triangular tail, very common in *H. Phlaeas*, is seldom seen. California examples agree with the eastern type, and not with the European species, as Strecker asserts.

35. FENISECA *Grote* (1869).

Type: Hesperia Tarquinius *Fabr.*

300. Tarquinius *Fabr.*, Ent. Syst., 3, 319 (*Hesperia*); Herbst, Natursyst. Ins. Schmett., 11, 376 (*Papilio*); God., Encycl. Méth., 9, 580 (*Erycina*); Boisd.-Le C., Lép. Am. Sept., 128–9 (*Polyommatus*); Westw.-Hewits., Gen. Diurn. Lep., 499 (*Chrysophanus*); Butl., Cat. Fabr. Lep., 174–5 (*Thestor*); Kirb., Syn. Cat. Lep., 345 (*Lycaena?*); Grote, Trans. Am. Ent. Soc., 2, 308 (*Feniseca*).

crataegi Boisd.-Le C., Lép. Am. Sept., pl. 37, figs. 1–5 (*Polyommatus*).

Porsenna Scudd., Proc. Ess. Inst., 3, 163–4 (*Polyommatus*).

Nova Scotia, Quebec and Toronto, southward—including White Mountain region—to Georgia and Florida in the east, and Kansas and Texas in the west.

Food-plants: *Alnus, Viburnum, Ribesia, Vaccinium.*

NOTE.—Keferstein (Zeitschr. ges. Naturw., 44, 227), gives a "Polyommatus Gabbii" as a Californian representative of the European Virgaureae. No species has yet been described under that name, and I know of no Californian species which may be considered an analogue of the European Virgaureae.

There is also no such insect as "Chrysophanus Nais Edw.," referred to in Kirby's Catalogue (p. 653), and even in Edwards' own Synopsis (p. 32), as well as in Strecker's Lepidoptera (p. 92–3). The case is similar to that given above in a note at the end of the Adolescentes; only here Edwards oddly copied Kirby.

April 7, 1876.

The President in the chair. Twenty-six persons present.

Professor Eugene A. Smith, State Geologist of Alabama, and Mr. John T. Humphreys, State Naturalist and Entomologist of Georgia, were elected Corresponding Members.

A paper, On Public Parks, was read by its author, Mr. Hugh McMillan. After a discussion of the paper, the thanks of the Society were voted to Mr. McMillan.

The following communication was read:

CORRECTIONS TO THE PAPER: A LIST OF NORTH AMERICAN SYRPHIDAE.

BY CH. R. OSTEN SACKEN.

Having been prevented, by absence, from revising the proofs of my list of North American Syrphidae, a number of errors have occurred in it, which, from their very nature, another proof reader but myself could not well become aware of. They were also partly owing to some errors in the manuscript.

I give here a list of such of these errors only, which might be misleading, omitting those which will be obvious to every dipterologist (as for instance, on page 39, *Petecocera, Pasagus, Pipija, Eumeous,* and on the next page, *Voludella,* instead of Pelecocera, Paragus, Pipiza, Eumerus, Volucella).

Page 39, line	3	from	bottom,	strike out the period at the end.
" 41, "	9	"	top,	for 11, 57, read 1157.
" 41, "	13	"	top,	for **aurulentis,** read **aurulentus.**
" 41, "	17	"	top,	for **caliopterus,** read **baliopterus.**
" 41, "	21	"	top,	for *englossoides,* read *euglossoides.*
" 43, "	4	"	top,	for p. 164, read 64.
" 44, "	14	"	top,	for **capiliata,** read **capillata.**
" 45, "	15 and 16	"	top,	should read thus:

naso *Walker,* List, etc., III, p. 587 (*Syrphus*). Hudson's Bay Terr. (Platychirus?—Verrall in litt.)

Pacilus *Walker,* Dipt. Saund. p. 240 (*Syrphus*). North America. (Platychirus. —Verrall in litt.)

Page 46, line 20 from bottom, for Häger, read Stäger.
" 47, " 14 " bottom, for **jactator,** read **jactator.**
" 47, " 9 " bottom, for 44, read 45.
" 48, " 6 " top, read *Mesogramma.*
" 48, " 9 and 11 " top, strike out the stars before **coalescens** and **corbis.**
Page 49, line 1 and 4 from bottom, for 33 and 34, read 83 and 84.
" 50, " 3 " bottom, for List, etc., III, read Auss. Zw. II.
" 53, " 4 " top, for *Orindia,* read *Ornidia.*
" 54, " 13 " bottom, read *Eristalis frater* Walker, etc.
" 54, " 10 " bottom, as a synonym to **E. Bastardii,** add, *Eristalis nebulosus* Walker, List, etc., III, p. 616.
Page 54, line 6 from bottom, as a synonym to **E. dimidiatus,** add, *Eristalis inflexus* Walker, List, etc., III, p. 617.
Page 54, line 4 from bottom, for *Herminieri,* read *Lherminieri.*
" 55, " 3 " top, for *Carda,* read *Barda.*
" 55, " 16 and 17 " top, for III, read II.
" 57, " 9 " top, read **chrysostomus.**
" 58, " 6 " bottom, for II, read 11.
" 62, " 11 " top, for 25, read 24.
" 66, " 21 " top, for *hind,* read *third.*
" 67, " 13 " bottom, for **racua,** read **vacua.**
" 67, " 1 " bottom, place comma after *incrassate;* strike out comma after *under side.*
Page 69, line 1 from top, for *wing,* read *ring.*
" 71, " 8 " bottom, for *Ptesiomma longivenuris,* read *Plesiomma longiventris.*

Mr. GROTE exhibited a specimen of EURYMENE ROSARIA *G. & R.*, taken near Buffalo. This species had not been published, though named many years ago. The larva had been found by Mr. WM. SAUNDERS on willow. It is a unicolorous species without the usual irrorations of the genus. Fore wings pale buff yellow, with the costa pink at base. The outer diffuse band buff, deeper shaded on internal margin, where it is tinged outwardly with pink. Hind wings paler, with a pink shade margining the brownish curved abbreviated mesial band at anal angle. Beneath the hind wings externally suffused with pink, as also costa of fore wings, under surface of abdomen and breast, else pale yellow. The female expands 38 mm.

MAY 5, 1876.

The Vice-President, Dr. GEO. E. HAYES, in the chair. Twenty-three persons present. A paper, On Rude Stone Monuments, was read by the author, Mr. ADOLF DUSCHAK.

Mr. DUSCHAK stated, that from the geographical distribution of rude stone monuments, they are referable to ancestor worship. Ancestor worship becomes an integral part of the religious system of tribes, when they have reached permanent abodes, before their ideas of religion are fully developed, as in the case of the Aryan race. When such tribes are by their environments retarded in their progress, this ancestor worship finds expression in rude stone monuments, and this accounts for their prevalence in the west and northwest of Europe. Where the conditions are favorable to a full development of all the mental and physical resources of a nation, as among the Greeks, Romans and Egyptians, this ancestor worship, in connection with the worship of the gods, gives rise to structures of the highest architectural order. The total absence of megalithic remains in countries where Semitic civilizations flourished, Mr. Duschak adduced as sustaining the above argument, since their religious ideas were formulated while they were in a nomadic state, which is most unfavorable to the development of ancestor worship, and this is furthermore proven by the absence of apotheosis of heroes in Semitic systems of religion. Mr. Herbert Spencer's argument in favor of ancestor worship among the Hebrews, from some prohibitions of the Mosaic law concerning the dead, Mr. Duschak thought not conclusive, since these laws can all of them be traced back to Egyptian influence, to a country where necrolatry had reached its highest development.

The following paper was read:

Check List of the Fishes of North America, by DAVID S. JORDAN, M. S., M. D., and HERBERT COPELAND, M. S.

The Secretary presented a communication from the American Association for the Advancement of Science, being the report of the Committee on Weights, Measures and Coinage, together with a Memorial to Congress on the subject for signature.

X. Check List of the Fishes of the Fresh Waters of North America

BY DAVID S. JORDAN, M. S. M. D. AND HERBERT E. COPELAND, M. S.

THIS list is designed to include all the species of fishes now described, from the fresh waters of North America north of Mexico, with the geographical distribution of each as far as recorded. The authors are well aware that it is incomplete—the necessary condition of a first check list—and, what is much more to be regretted, very redundant, for which workers in American Ichthyology are responsible. It is believed, however, that it gives a fair view of the present state of our knowledge of our inland fishes.

About one-third of the species here recorded, and a number of the genera, are considered by the authors as "doubtful." The nature of the doubt is indicated, as in Prof. Gill's "Catalogue of the Fishes of the East Coast of N. A.," by the following signs: *d. s.*, doubtful species; *d. g.*, doubtful genus; *d. a. s.*, doubtful as to species; *d. a. g.*, doubtful as to genus.

Those genera and species not so marked, are: (*a*), those which are undoubtedly valid; (*b*), those which, from the peculiar characters assigned to them, *seem* to be valid; and (*c*), those which, for various reasons, we do not feel warranted in calling into question.

The doubtful species are of two classes. Firstly, those doubtful as species, but well known, and at least representing well-marked varieties. To this class belong such fishes as *Poecilichthys spectabilis* and *Argyrosomus sisco*. Secondly, a much larger class, including those not satisfactorily verified since their original description, when the description itself is wanting in truly distinctive characters. To this class belong nearly all the species described by Girard, from the region beyond the Mississippi river.

The mere question of priority of name is not regarded as affecting the validity of a species or genus as herein printed.

The following grades of "species" are omitted: 1. Generally admitted synonyms. 2. Species we know to be synonymous, although not hitherto considered as such. 3. Species described

from "N. A." or "U. S." without any indication of habitat. 4. Species so imperfectly described that we are unable to refer them with any degree of certainty to the proper genus. 5. Species overlooked or forgotten.

The type of a genus is the species first mentioned, unless otherwise expressed.

This list contains about 600 nominal species. A few remain to be described, but a very much larger number will certainly be eliminated when Ichthyology receives the careful revision that has been made in Ornithology and Herpetology.

ETHEOSTOMIDAE.

1. MICROPERCA Putnam, 1863.

1. **Microperca punctulata** Putnam. Wisconsin to Alabama.

2. CATONOTUS Agassiz, 1854. *d. g.*

2. **Catonotus lineolatus** Agassiz. Illinois; Wisconsin. *d. s.*
3. **Catonotus flabellatus** (Raf.) Putnam. New York to Illinois and South.
4. **Catonotus lepidus** (Grd.) Jordan. Rio Grande Region. *d. a. g.*

3. ALVARIUS Girard, 1859. *d. g.*

5. **Alvarius lateralis** Girard. Rio Grande Region.

4. NOTHONOTUS Agassiz, 1863. *d. g.*

6. **Nothonotus niger** (Raf.) Jordan. Ohio Valley.
   (syn. *Etheostoma maculata*, Kirt.)
7. **Nothonotus punctulatus** Agassiz. Missouri, and S. W. *d. s.*

5. POECILICHTHYS Agassiz, 1854.

8. **Poecilichthys caeruleus** (Storer) Agassiz. Ohio to Wis.; Ill.; Mo.
9. **Poecilichthys spectabilis** Agassiz. Indiana to Missouri. *d. s.*
10. **Poecilichthys zonalis** Cope. Indiana to Tennessee.
11. **Poecilichthys pottsii** (Grd.) Jordan. Rio Grande Region. *d. s.*
12. **Poecilichthys vitraeus** Cope. French Broad R.
13. **Poecilichthys rufilineatus** Cope. French Broad R.
14. **Poecilichthys vulneratus** Cope. French Broad R.
15. **Poecilichthys cinereus** (Storer) Jordan. Tennessee R. *d. a. g.*
16. **Poecilichthys tessellatus** (Storer) Jordan. Tennessee R. *d. a. g.*
17. **Poecilichthys mesaeus** Cope. Kansas. *d. a. g. d. s.*

6. BOLEICHTHYS Girard, 1859.

§ BOLEICHTHYS Girard.

18. **Boleichthys exilis** Girard. Wisconsin to Upper Missouri.
19. **Boleichthys warreni** Girard. Upper Missouri.
20. **Boleichthys elegans** Girard. Texas.

§ HOLOLEPIS Agassiz, 1863.

21. **Boleichthys barratti** (Holb.) Jordan. South Carolina.
22. **Boleichthys fusiformis** (Girard) Jordan. Massachusetts.
23. **Boleichthys erochrous** (Cope.) Jordan. New Jersey.

7. PLEUROLEPIS Agassiz, 1863.

24. **Pleurolepis pellucidus** Agassiz. Pennsylvania to Mississippi River.

8. BOLEOSOMA Dekay, 1842.

25. **Boleosoma olmstedi** (Storer) Agassiz. New England to Wisconsin.
26. **Boleosoma effulgens** (Girard) Cope. N. C. and Ind. to Wis. and South.
27. **Boleosoma maculaticeps** Cope. Catawba River.
28. **Boleosoma tessellatum** Thompson nec Dekay. L. Champlain. *d. s.*
29. **Boleosoma fasciatum** (Girard) Jordan. Rio Grande Region. *d. s.*
30. **Boleosoma gracile** Girard. Rio Grande Region.

9. DIPLESIUM Rafinesque, 1820.

(syn. *Hyostoma* Agassiz, 1854.)

31. **Diplesium blennioides** (Raf.) Jordan, nec Girard ; (syn. *Pileoma cymatogrammum* Abbott ; *Etheostoma variata* Kirtland ; *Hyostoma blennioperca* Cope.) Pennsylvania to Alabama and West.
32. **Diplesium simoterum** (Cope.) Copeland. Upper Tennessee.

10. ETHEOSTOMA Rafinesque, 1820.

33. **Etheostoma blennioides** Ag., nec Raf. Ohio Val. N. to Wis. and Mich.
34. **Etheostoma peltatum** Stauffer. Pennsylvania. *d. s.*
35. **Etheostoma maculatum** (Girard) Cope. Penn. to Virginia. *d. s.*
36. **Etheostoma macrocephalum** Cope. Youghiogheny River. *d. s.*
37. **Etheostoma nigrofasciatum** (Agassiz) Jordan ; (syn. *Hadropterus shumardi* Girard.) Indiana to Arkansas and Alabama.
38. **Etheostoma nevisiense** Cope. North Carolina.

11. HYPOHOMUS Cope., 1870.

39. **Hypohomus aurantiacus** Cope. French Broad River.

12. PERCINA Haldeman, 1842.

40. **Percina caprodes** (Raf.) Girard. Lake Champlain to Arkansas.
41. **Percina carbonaria** Girard. Rio Grande Region. *d. s.*

PERCIDAE.

13. PERCA Linnaeus. 1766.

Type : Perca fluviatilis L. (Europe).

42. **Perca flavescens** (Mit.) Cuv. Great Lakes and Atlantic Streams.

14. STIZOSTEDIUM Rafinesque, 1820.

43. **Stizostedium salmoneum** Raf. Ohio Valley.
44. **Stizostedium americanum** (Cuv.) Girard. Great Lakes and Ohio Val.
45. **Stizostedium griseum** (Dekay) Milner. Great Lakes. *d. s.*
46. **Stizostedium boreum** (Rich.) Girard. Upper Mo. River and N. *d. s.*
47. **Stizostedium canadense** (Smith) Milner. St. Lawrence River. *d. s.*

LABRACIDAE.

15. ROCCUS Mitchill, 1817.

Type: Roccus striatus Mit.=Sciaena lineata Bloch. (Atlantic Coast.)

§ LEPIBEMA Rafinesque, 1820.

48. **R. chrysops** (Raf.) Gill. Great Lakes ; Ohio Valley.

16. MORONE Mitchill, 1817.

Type : Morone rufa Mit.=Perca americana Gmel. (Atlantic Coast).

49. **M. interrupta** Gill. Lower Mississippi River.

ICHTHELIDAE.

17. MICROPTERUS Lacepede, 1802.

50. **M. salmoides** (Lac.) Gill. Great Lakes ; Ohio Valley, etc., rather N.
51. **M. nigricans** (C. and V.) Gill. Great Lakes ; Miss. Valley, rather S.

18. CENTRARCHUS Cuvier, 1829.

52. **C. irideus** Cuv. South Carolina, etc.

19. POMOXYS Rafinesque, 1818.

§ POMOXYS Raf.

53. **P. annularis** Raf. Ohio Valley and Mississippi Valley.

§ HYPERISTIUS Gill, 1864.

*54. **P. hexacanthus** (C. and V.) Ag. Great Lakes to Pennsylvania and South, east of mountains.

20. ARCHOPLITES Gill, 1861.

56. **A. interruptus** (Grd.) Gill. Rivers of California.

21. AMBLOPLITES Rafinesque, 1820.

57. **A. rupestris** (Raf.) Gill. Great Lakes; Mississippi Valley and South.
58. **A. cavifrons** Cope. Roanoke River.

22. ACANTHARCHUS Gill 1864.

59. **A. pomotis** (Baird) Gill. New York, New Jersey and E. Pennsylvania.

23. HEMIOPLITES Cope, 1869.

60. **H. simulans** Cope. James River, Va.

23½. †COPELANDIA Jordan, 1876.

60. (b) **C. eriarcha** Jordan (MSS.). Wisconsin.

24. ENNEACANTHUS Gill, 1864.

61. **E. obesus** (Baird) Gill. Massachusetts to North Carolina, coastwise.
62. **E. gloriosus** (Holb.) Jordan. Maryland to Florida.
63. **E. fasciatus** (Holb.) Jordan. St. Johns River.

25. MESOGONISTIUS Gill, 1864.

65. **M. chaetodon** (Baird) Gill. New Jersey; Maryland.

26. CHAENOBRYTTUS Gill, 1864.

(syn. *Glossoplites* Jordan, 1876; same type.)

66. **C. gulosus** (C. and V.) Cope.; (syn. *Calliurus melanops*, Girard.) Illinois to Texas.
67. **C. gillii** Cope. Virginia; North Carolina. *d. s.*
68. **C. floridensis** (Holb.) Jordan. St. Johns River, Florida. *d. s.*
69. **C. viridis** (C. and V.) Jordan. South Carolina to Florida.

---

*The pages preceding this (133 to 136) were printed in May and before the rest of the paper. A few changes in them are necessary. On page 136, read:

44. **Stizostedium vitreum** (Mit.) J. and C. Great Lakes and S. E.
51. **Micropterus floridanus** (Le S.) Goode. Great Lakes to Florida.
52. **Centrarchus irideus** (Bosc) C. and V. South Illinois to North Carolina and Florida.

A revision of the "Etheostomidae" will be elsewhere given.

†I would dedicate this new genus to the memory of my friend and long-time fellow-student, Prof. H. E. Copeland, whose death, due to exposure while on a collecting expedition, took place Dec. 12, 1876, even as this paper was passing through the press.

The genus *Copelandia* may be thus characterized: Aspect of Enneacanthus—opercle emarginate, with a black dermal border; a supernumeray maxillary bone; palatine teeth; dorsal spines, ten; anal spines, four; caudal rounded; appendages on branchial arches, long, and in small number, much as in Ambloplites; anal fin large. The typical species, *C. eriarcha*, will be elsewhere described A single fine specimen received by Prof. Copeland and myself, from Dr. P. R. Hoy, taken in the Menomonee River, at Wauwatosa, Milwaukee Co., Wis.—D. S. J.

27. TELIPOMIS Rafinesque, 1820.

(syn. *Calliurus* Agassiz, 1854, nec Raf., 1818.

70. **T. cyanellus** (Raf.) Jordan; (syn. *Calliurus longulus* Grd., *Chaenobryttus mineopas* Cope.) Ohio to Nebraska.
72. **T. nephelus** (Cope.) Jordan. Ohio Valley. *d. a. g.*
73. **T. murinus** (Grd.) Jordan. Texas. *d. s.*
74. **T. microps** (Grd.) Jordan. Illinois to Nebraska.
75. **T. diaphanus** (Grd.) Jordan. Texas. *d. s.*

28. ICHTHELIS Rafinesque, 1820.

(syn. *Lepomis* Cope., 1868, nec Raf., 1820.)

76. **I. megalotis** Raf. Ohio Valley to Illinois.
77. **I. sanguinolentus** (Ag.) Bliss. Georgia and Alabama.
77. (b) **I. nitidus** (Kirtland) Bliss. Ohio Valley to Illinois.
78. **I. appendix** (Mit.) Bliss. New Hampshire to North Carolina east of mountains. *d. s.*
79. **I. auritus** (L.) nec Raf.; (syn. *I. rubricauda* Holb.) N. Car. to Florida.
80. **I. fallax** (B. and G.) Jordan. Arkansas; Texas. *d. s.*
81. **I. aquilensis** (B. and G.) Nelson. Lower Mississippi Valley.
82. **I. breviceps** (B. and G.) Jordan. Arkansas to Colorado and South. *d. s.*
83. **I. incisor** (C. and V.) Holb. Great Lakes to New Jersey and South.
84. **I. speciosus** (Grd.) Jordan. Indiana to Texas. *d. s.*
85. **I. obscurus** (Ag.) Jordan. Tennessee, Georgia and Alabama.
86. **I. bombifrons** (Ag.) Bliss. Tennessee River, Alabama.
87. **I. macrochira** Raf. Ohio Valley.
88. **I. inscriptus** (Ag.) Bliss. Indiana to Alabama.
89. **I. anagallinus** (Cope.) Bliss. Michigan to Tennessee and Kansas.
90. **I. oculatus** (Cope.) Jordan. Minnesota. *d. s.*
91. **I. humilis** (Grd.) Jordan. Arkansas to Utah and South.
92. **I. albulus** (Grd.) Jordan. Texas. *d. s.*
93. **I. signifer** (Grd.) Jordan. Texas. *d. s.*
94. **I. elongatus** (Holb.) Jordan. St. Johns River, Fla. *d. a. g.*
95. **I. microlophus** (Günther) Jordan. St. Johns River, Fla.
96. **I. marginatus** (Holb.) Jordan. St. Johns River, Fla.
97. **I. punctatus** (C. and V.) Jordan. Atlantic States. *d. s. d. a. g.*
97½. **I. solis** (C. and V.) Jor. Louisiana. *d. s.*

29. POMOTIS Rafinesque, 1820.

98. **P. aureus** (Walb.) Gill. Great Lakes; Upper Mississippi, East to Maine, South to Florida, chiefly North and coastwise.
99. **P. notatus** Ag. Tennessee River.
100. **P. pallidus** Ag. Tennessee River.

APHREDODERIDAE.

30. APHREDODERUS Le Sueur, 1833.

101. **A. sayanus** (Gilliams) Dekay. New Jersey to Louisiana; coastwise.

30½. STERNOTREMIA Nelson, 1876.

101. (b) **S. isolepis** Nelson. Illinois.

SCIAENIDAE.

31. HAPLOIDONOTUS Rafinesque, 1819.

102. **H. grunniens** Raf. Great Lakes to James River and South.
103. **H. concinnus** (Ag.) Gill. Tennessee River. *d. s.*
104. **H. lineatus** (Ag.) Gill. Missouri to Tennessee, etc. *d. s.*
104. (b) **H. neglectus** (Grd.) Gill. Texas. *d. s.*

31½. EUTYCHELITHUS Jordan, 1876.

105. **E. richardsonii** (C. and V.) Jor. Upper Great Lakes.

COTTIDAE.

32. PEGEDICHTHYS Rafinesque, 1820.

(syn. *Potamocottus* Gill, 1861.)

106. **P. ictalurops** Raf.; (syn. *Potamocottus carolinae* Gill.) Ind. to Tenn.
107. **P. punctulatus** (Gill) Jordan. Headwaters of Colorado River; Rocky Mountains.
107. (b) **P. meridionalis** (Grd.) Jor. Pennsylvania to Virginia. *d. s.*
108. **P. zotherus** Jordan (n. sp. MSS. Fishes of Georgia.) Alabama River.
109. **P. cognatus** (Rich.) Jordan. British America.
110. **P. richardsonii** (Ag.) Jordan. Lake Superior region.
111. **P. bairdii** (Grd.) Jordan. Ohio to Minnesota.
112. **P. wilsoni** (Grd.) Jordan. Pennsylvania to Indiana.
113. **P. alvordi** (Grd.) Jordan. Great Lakes.
114. **P. gulosus** (Grd.) Jordan. Oregon and California. *d. a. g.*
115. **P. parvus** (Grd.) Jordan. California. *d. a. g.*
115. (b) **P. spilotus** (Cope.) Jor. Lake Michigan. *d. s. d. a. g.*
115. (c) **P. wheeleri** (Cope.) J. and C. Beaver River, Utah.

33. URANIDEA Dekay, 1842. *d. g.*

116. **U. gracilis** (Heckel) Putnam. New York and East.
117. **U. viscosa** (Haldeman) Cope. Pennsylvania to Virginia.
118. **U. franklini** (Ag.) Jordan. Lake Superior.
119. **U. fabricii** (Grd.) Jordan. Greenland.
120. **U. gobioides** (Grd.) Jordan. Lake Champlain.
121. **U. boleoides** (Grd.) Jordan. West Vermont.
122. **U. formosa** (Grd.) Jordan. Lake Ontario. *d. s.*
123. **U. hoyi** Putnam. Lake Michigan.
124. **U. kumlieni** Hoy. Lake Michigan.

34. **COTTOPSIS** Girard, 1850.

125. **C. asper** (Rich.) Grd. Columbia River.
126. **C. subscaber** Cope. Idaho.
126. (b) **C. ricii** Nelson. Lake Michigan.

35. **TRIGLOPSIS** Girard, 1851.

127. **T. thompsoni** Grd. Great Lakes in deep waters.

GOBIIDAE.

36. **GOBIOSOMA** Girard, 1854.

Type: Gobius alepidotus Bloch and Schneider (Atlantic Coast).

128. **G. molestum** Grd. Coast of Texas—ascending streams to Louisville, Ky.

37. **ELEOTRIS** Gronovius, 1763.

129. **E. gyrinus** C. and V. Texas to South America, coastwise.
130. **E. somnolentus** Grd. Rio Grande.

38. **PHILYPNUS** Valenciennes, 1837.

131. **P. dormitator** (Bl. and Schn.) C. and V. Texas, W. Indies and S.

CHROMIDIDAE.

39. **HERICHTHYS** Baird and Girard, 1854.

132. **H. cyanoguttatus** B. and G. Texas and Mexico.

GADIDAE.

40. **LOTA** Cuvier, 1817.

Type: Gadus lota L.=vulgaris Cuv. (Europe.

133. **L. lacustris** (Walb.) Gill. Great Lakes to New England and North.
133 (b) **L. compressa** (Le S.) C. and V. New England. *d. s.*

GASTEROSTEIDAE.

41. **GASTEROSTEUS** Linnaeus, 1748.

Type: Gasterosteus aculeatus L. (Europe.)

134. **G. microcephalus** Girard. Tulare Basin, Cal.

42. **PYGOSTEUS** Brevoort, 1861.

Type: Gasterosteus occidentalis C. and V. (Atlantic Coast.)

135. **P. nebulosus** (Ag.) Jordan. Upper Great Lakes. *d. s.*
136. **P. mainensis** (Storer) Brev. Kennebec River.
137. **P. concinnus** (Rich.) Jor. Saskatchawan River to Great Bear Lake.

43. APELTES Dekay, 1842.

138. **A. quadracus** (Mit.) Brev. Eastern Coast—ascending streams.

44. EUCALIA Jordan, 1876.

139. **E. inconstans** (Kirtland) Jordan. Ohio to Kansas and N. (Greenland ?)
140. **E. pygmaea** (Ag.) Jordan. Lake Superior. *d. s.*
141. **E. micropus** (Cope) Jordan. Kansas. *d. s.*
142. **E. cayuga** Jordan. Cayuga Lake, N. Y. *d. s.*
143. **E. williamsonii** (Grd.) Jordan. Williamson's Pass, Cal. *d. a. g.*

ATHERINIDAE.

45. LABIDESTHES Cope, 1870.

144. **L. sicculus** Cope. Michigan to Illinois and Tennessee.

CYPRINODONTIDAE.

46. CYPRINODON Lacepede, 1803.

145. **C. variegatus** Lac. Atlantic Coast—entering streams.
146. **C. parvus** B. and G. Cape Cod to North Carolina. *d. a. g.*
147. **C. elegans** B. and G. Rio Grande. *d. s.*
148. **C. bovinus** B. and G. Texas. *d. s.*
149. **C. macularius** B. and G. San Pedro River. (Gila.)
150. **C. gibbosus** B. and G. Texas.
151. **C. californiensis** Grd. San Diego, Cal.

47. HYDRARGYRA Lacepede, 1803. *d. g.*

152. **H. swampina** Lac. North Carolina to Florida, coastwise. *d. s.*
153. **H. majalis** (Walb.) Val. Cape Cod to North Carolina, coastwise.
154. **H. similis** B. and G. Florida to Texas. *d. a. g.*

48. FUNDULUS Lacepede, 1803.

155. **F. heteroclitus** (L.) Gill. Cape Cod to Florida—entering streams.
156. **F. pisculentus** (Mit.) Val. Atlantic Coast—entering streams.
157. **F. nigrofasciatus** (Le S.) Val. Atlantic Coast—entering streams.
158. **F. diaphanus** (Le S.) Ag.; (syn. *F. multifasciatus* (Le S.) Val.) Coasts, ascending all streams to their fountain heads; hence inland to Michigan, Wisconsin and Colorado.
159. **F. zebra** (Grd.) Gthr. Rio Grande. *d. a. g.*
160. **F. seminolis** Grd. Florida. *d. s.*
161. **F. parvipinnis** Grd. San Diego, Cal. *d. a. g.*
162. **F. grandis** B. and G. Texas.

49. *XENISMA Jordan, 1876. *d. g.*

163. **X. stellifera** Jordan (MSS. Fishes of Georgia). Alabama River.
164. **X. catenata** (Storer) Jordan. Tennessee River.

50. MICRISTIUS Gill, 1865. *d. g.*

165. **M. zonatus** (Mitch.) Gill. Cape Cod to Florida, coastwise.
166. **M. cingulatus** (C. and V.) Gill. Cape Cod to Florida, coastwise. *d. s.*
167. **M. chrysotus** (Gthr.) Gill. North Carolina to Florida, coastwise. *d. s.*

51. ZYGONECTES Agassiz, 1854. *d. g.*

168. **Z. notatus** (Raf.) Jordan ; (syn. *Z. olivaceus* (Storer) Ag.) Mich. to Ala.
169. **Z. nottii** Ag. Georgia to Mississippi.
170. **Z. sciadicus** (Cope) Jordan. Platte River.
171. **Z. melanops** (Cope) Jordan. North Carolina.
172. **Z. floripinnis** (Cope) Jordan. Colorado.
172. (b) **Z. guttatus** Ag. Alabama.
172. (c) **Z. dispar** Ag. Illinois, Missouri.
172. (d) **Z. hieroglyphicus** Ag. Alabama.

52. LUCANIA Girard, 1859.

173. **L. venusta** Grd. Texas.
174. **L. affinis** Grd. Matamoras. *d. s.*

53. GIRARDINICHTHYS Bleeker, 1860.

175. **G. innominatus** Bleeker. Mexico.

54. GIRARDINUS Poey, 1851.

Type: Girardinus uninotatus Poey. (Cuba.)

176. **G. formosus** (Ag.) Grd. South Carolina to Louisiana.
177. **G. occidentalis** (B. and G.) Grd. New Mexico.
178. **G. sonoriensis** Grd. Sonora.

55. GAMBUSIA Poey, 1851.

Type: Gambusia punctata Poey. (Cuba.)

179. **G. holbrooki** (Ag.) Grd. Florida to Texas.
180. **G. nobilis** B. and G. Texas.
181. **G. affinis** B. and G. Texas.
182. **G. patruelis** B. and G. Texas. *d. s.*
183. **G. gracilis** Grd. Matamoras. *d. s.*
184. **G. speciosa** Grd. New Leon. *d. s.*
185. **G. senilis** Grd. Chihuahua River. *d. s.*

56. ADINIA Girard, 1859. *d. g.*

186. **A. multifasciata** Grd. Texas.

---

* This name is proposed for the genus (or perhaps the sub-genus of Fundulus) typified by Fundulus stelliferus Jordan MSS. characterized by the large dorsal fin, the origin of which is directly over the origin of the anal, by the reduced number of branchiostegals (three or four) and by peculiarities of coloration, the males being ornamented by bright orange spots, which are represented in the females by olive dots or lines.

57. **MOLLINESIA** Le Sueur, 1821.

187. **M. latipinna** Le S. Florida to Texas.
188. **M. lineolata** Grd. Texas. *d. s.*
189. **M. formosa** (Grd.) Gthr. Mexico.
190. **M. matamorensis** (Grd.) Jordan. Matamoras. *d. s.*
191. **M. poecilioides** (Grd.) Jordan. *d. s.*
192. **M. couchiana** (Grd.) Jordan. New Leon. *d. a. g.*

UMBRIDAE.

58. **MELANURA** Agassiz, 1854. *d. g.*

193. **M. limi** (Kirtl.) Ag. Vermont and New Jersey to Kentucky and Minn.

AMBLYOPSIDAE.

59. **AMBLYOPSIS** Dekay, 1842.

194. **A. spelaeus** Dekay. Caves of the limestone regions of Ind. and Ky

60. **TYPHLICHTHYS** Girard, 1859.

195. **T. subterraneus** Grd. Caves of Indiana and Kentucky.

61. **CHOLOGASTER** Agassiz, 1854.

196. **C. cornutus** Ag. Rice ditches of South Carolina.
197. **C. agassizii** Putnam. Mammoth Cave and subterranean stream, Lebanon, Tenn.

ESOCIDAE.

62. **ESOX** Linnaeus, 1748.

Type: Esox lucius L. (Europe.)

198. **E. lucius estor** Le Sueur. Great Lakes, Upper Miss. and N.
199. **E. nobilior** Thompson. Great Lake region.

63. **PICORELLUS** Rafinesque, 1820. *d. g.*

200. **P. vittatus** Raf. Ohio Valley. *d. s.*
201. **P. salmoneus** Raf. Ohio Valley and Michigan.
202. **P. americanus** (Lac.) Jordan. Massachusetts to Maryland, east.
203. **P. ravenelii** (Holbr.) Jordan. South Carolina. *d. s.*
204. **P. cyppo** (Cope.) J. and C. Pennsylvania to Illinois.
204. (b) **P. crassus** (Ag.) Jordan. Tennessee River and South. *d. s.*
205. **P. affinis** (Holb.) Jordan. North Carolina to Georgia. *d. s.*
206. **P. reticulatus** (Le S.) Jordan. N. E. to Virginia, chiefly coastwise.

PERCOPSIDAE.

63. PERCOPSIS Agassiz, 1850.

207. **P. guttatus** Ag. Great Lakes to Delaware, Potomac and Ohio rivers.
208. **P. hammondi** Gill. Kansas. *d. s.*

CHARACINIDAE.

64. ASTYANAX Baird and Girard, 1854. *d. g.*

209. **A. argentatus** B. and G. Texas, Arkansas? (Le Sueur.)

SALMONIDAE.

65. SALMO Linnaeus, 1748.

Type: Salmo salar L. (Marine.)

210. **S. fontinalis** Mitch. Northern North America; South to French Broad River.
211. **S. iridea** Gibbons. California and Pacific States.
212. **S. masoni** Suckley. Columbia River. *d. s.*
213. **S. pleuriticus** Cope. Colorado to Arizona.
214. **S. virginalis** (Grd.) Suckley. Colorado River, etc.
214. (b) **S. carinatus** Cope. Rocky Mountains. *d. s.*
215. **S. lewisi** (Grd.) Suckley, Upper Missouri River.
216. **S. stomias** Cope. Platte River, Kansas.
217. **S. spilurus** Cope. New Mexico.
218. **S. brevicauda** Suckley. Washington Territory and Columbia River.
219. **S. gibbsii** Suckley. Columbia River.
220. **S. sebago** Grd. Sebago Lake, Me.
221. **S. warreni** Suckley. Frazer's River. *d. s.*
222. **S. kennerlyi** Suckley. Frazer's River.
223. **S. bairdii** Suckley, Columbia River.
224. **S. parkii** Suckley, Kootenay River, Rocky Mountains.
225. **S. oquassa** Grd. Streams in Maine.
226. **S. namaycush** Pennant. Great Lakes.
227. **S. siscowet** Ag. Lake Superior.
228. **S. confinis** DeK. Lakes of New York. *d. s.*
229. **S. symmetrica** Prescott. Lake Winnepiseogee. *d. s.*
230. **S. hoodii**, Richardson. Lakes north of Canada.
231. **S. newberryi** Grd. Klamath River. *d. s.*
232. **S. alipes** Rich. Lakes of Boothia Felix. *d. s.*
233. **S. nitidus** Rich. Lakes of Boothia Felix. *d. s.*
234. **S. utah** Suckley. Lake Utah. *d. s.*

66. **THYMALLUS** Cuvier, 1829.

Type: Salmo thymallus L. = Thymallus vulgaris Auct. (Europe.)

235. **T. signifer** (Rich.) C. and V. British America.
236. **T. tricolor** Cope. Streams of Northern Michigan.
237. **T. montanus** Milner. Missouri River, Montana.
238. **T. ontariensis** C. and V. Lake Ontario, Canada. *d. s.*

67. **STENODUS.** Auct. (?)

(syn. *Luciotrutta* Gthr., 1866.)

239. **S. mackenzii** (Rich.). Mackenzie's River.

68. **ARGYROSOMUS** Agassiz, 1850.

240. **A. clupeiformis** (Mitch.) Ag. Great Lake region.
241. **A. clupeiformis sisco** Jordan. Lakes Geneva, Nemahbin, Oconomowoc, La Belle, etc., of Wisconsin; Lake Tippecanoe, etc., of Ind.
242. **A. nigripinnis** Gill. Lake Michigan.
243. **A. hoyi** Gill. Upper Lakes.
244. **A. tullibee** (Rich.) Ag. Lake Superior and North.

69. **COREGONUS** Linnaeus, 1748.

Type: Salmo oxyrhynchus L. (Europe.)

245. **C. albus** Le Sueur. Great Lake Region.
246. **C. labradoricus** Rich. St. Lawrence River, north. *d. s.*
247. **C. quadrilateralis** Rich. Upper Great Lakes,
248. **C. williamsoni** Grd. Utah to Washington Territory.
249. **C. couesii** Milner. Chief Mountain Lake, Montana.

HYODONTIDAE.

70. **HYODON** Le Sueur, 1818.

250. **H. tergisus** Le Sueur. Upper Great Lakes and Mississippi Valley.

CLUPEIDAE.

71. **ALOSA** Cuvier, 1829.

Type; Clupea alosa L. = Alosa communis Auct. (Europe.)

251. **A. sapidissima** (Wilson) Storer. Eastern coast, and introduced in many streams.

72. **POMOLOBUS** Rafinesque, 1820.

252. **P. chrysochloris** Raf. Ohio River and Lower Mississippi introduced into Lakes.

253. **P. pseudoharengus lacustris** Jordan. Cayuga Lake.

73. **DOROSOMA** Rafinesque, 1820.

254. **D. cepedianum notatum** Raf. Ohio River, Mississippi River escaped into Lakes.

*CYPRINIDAE.

74. **EXOGLOSSUM** Rafinesque, 1818.

255. **E. maxillingua** (Le S.) Haldeman. New York to Ohio and Maryland.

75. **SARCIDIUM** Cope, 1872.

256. **S. scopiferum** Cope, Missouri River, Mo.

257. **S. mirabile** (Grd.) Cope. Arkansas River.

76. **CHONDROSTOMA** Agassiz, 1837.

Type: Cyprinus nasus L. (European.)

258. **C. gardoneum** (Val.) Cope. South Carolina. *d. s. d. a. g.*

77. **ACROCHILUS** Agassiz, 1855.

259. **A. alutaceus** Ag. and Pick. Columbia River.

78. **ORTHODON** Girard, 1856.

260. **O. microlepidotus** (Ayres) Grd. California, Utah (*Yarrow*).

79. **CAMPOSTOMA** Agassiz, 1855.

261. **C. anomalum** (Raf.) Ag. Ohio to Montana and South.

262. **C. formosulum** Grd. San Antonio River. *d. s.*

363. **C. nasutum** Grd. New Leon. *d. s.*

264. **C. aikeni** Cope. Pueblo, Cal.

265. **C. ornatum** Grd. Chihuahua River.

266. **C. placidum** (Grd.) Cope. Arkansas River. *d. a g.*

80. **PIMEPHALES** Rafinesque, 1820.

267. **P. promelas** Raf. Montana to Pennsylvania, Ohio Valley and Arkansas.

268. **P. melanocephalus** (Abbott) J. and C. Michigan to Illinois. *d. s.*

---

*Most of the species of Cyprinidae here mentioned from the region west of the Mississippi River are known to the authors only from the accounts of Girard and Cope. The arrangement here given is therefore to be considered as the result of our best judgment, with only the published literature on the subject to guide us. Nearly all the species admitted from the region east of the Mississippi have been pretty thoroughly tested by one or both of the writers. We have here adopted all the genera proposed by Rafinesque, which have priority of date, in which we have been able to identify the typical species, whether any tangible characters were assigned to the genus by its author or not. If we adopt any, as Cycleptus, Carpiodes, etc., we must adopt all. No middle course is possible.

81. HYBORHYNCHUS Agassiz, 1855.

269. **H. notatus** (Raf.) Ag. Ohio Valley to New York, and West.
270. **H. superciliosus** Cope. Ohio Valley and North. *d. s.*
271. **H. nigellus** Cope. Arkansas River, Col.
272. **H. siderius** Cope. Arizona.
273. **H. perspicuus** Grd. Arkansas River. *d. a. g.*
274. **H. confertus** Grd. Texas. *d. a. g.*

82. COCHLOGNATHUS Baird and Girard, 1854.

275. **C. ornatus** B. and G. Rio Grande.

83. CODOMA Girard, 1856.

276. **C. ornata** Grd. Chihuahua River.
277. **C. vittata** Grd. New Mexico.

84. HYBOGNATHUS Agassiz, 1855.

278. **H. nuchalis** Ag. Ohio Valley to Colorado.
279. **H. argyritis** Grd. New Jersey to North Carolina; west to Arkansas.

85. COLISCUS Cope, 1872.

380. **C. parietalis** Cope. Missouri River, Mo.

86. CLIOLA Girard, 1856. *d. g.*

281. **C. vigilax** (B. and G.) Grd. Red River.
282. **C. velox** Grd. San Antonio River.
283. **C. vivax** Grd. Texas. *d. s.*

87. DIONDA Girard, 1856. *d. g.*

284. **D. episcopa** Grd. Texas.
285. **D. argentosa** Grd. Texas. *d. s.*
286. **D. serena** Grd. Texas. *d. s.*
287. **D. chrysitis** Grd. Texas. *d. s.*
288. **D. melanops** Grd. Coahuila. Texas. *d. s.*
289. **D. couchii** Grd. New Leon. *d. s.*
290. **D. texensis** Grd. Texas. *d. s.*
291. **D. papalis** Grd. Texas. *d. s.*
292. **D. plumbea** Grd. Canadian River. *d. s.*
293. **D. spadicea** Grd. Arkansas. *d. s.*
294. **D. grisea** Grd. Indian Territory. *d. s.*

88. ERICYMBA Cope, 1865.

295. **E. buccata** Cope. Pennsylvania to Illinois and Tennessee.

89. SEMOTILUS Rafinesque, 1820.

§ SEMOTILUS.

296. **S. corporalis** (Mitch.) Putnam. Massachusetts to Idaho and South.
297. **S. pallidus** (Grd.) Cope. Arkansas to Nebraska. *d. s.*

§ LEUCOSOMUS Haeckel, 1842.

298. **S. argenteus** (Storer) Putnam. New England and New York.
299. **S. rhotheus** Cope. New York to Virginia. *d. s.*
300. **S. dissimilis** (Grd.) Jordan. Milk River, Montana. *d. s.*

90. POGONICHTHYS, Girard, 1854.

301. **P. inaequilobus** B. and G. California.
302. **P. symmetricus** B. and G. California. *d. s.*
303. **P. argyriosus** B. and G. California. *d. s.*

91. PLATYGOBIO Gill, 186–. *d. g.*

304. **P. communis** (Grd.) Gill. Montana to California.
305. **P. gulonellus** Cope. Bridger's Pass.

92. CERATICHTHYS Baird, 1853.

306. **C. biguttatus** (Kirt.) Bd. (syn.? *cat. melanotus* Raf.; *Leuciscus scroceus* Storer; *Nocomis bellicus* Grd). Pennsylvania to Utah and S.
307. **C. micropogon** Cope. Eastern Pennsylvania. *d. s.*
308. **C. nebrascensis** (Grd.) Jordan. Sweetwater River. *d. s.*
309. **C. amblops** (Raf.) Grd. (syn. *C. hyalinus* Cope. Indiana to North Carolina and Alabama.
309. (b) **C. winchelli** (Grd.) J. and C. Alabama River. *d. s.*
309. (c) **C. labrosus** Cops. North Carolina. *d. s.*
309. (d) **C. rubrifrons** Jordan. Ockmulgee River. *d. s.*
310. **C. hypsinotus** Cope. Catawba River. *d. s.*
311. **C. dissimilis** (Kirt.) Cope. Ohio Valley.
312. **C. monachus** Cope. Holston River.
313. **C. cataractae** (C. and V.) Cope. Niagara River.
314. **C. leptocephalus** Grd. North Carolina. *d. s.*
315. **C. sterletus** Cope. New Mexico.
316. **C. physignathus** Cope. Arkansas River, Col.
317. **C. cumingi** Gthr. California. *d. s.*

318. **C. prosthemius** Cope. Lake Superior.
319. **C. squamilentus** Cope. Green River, Wyoming.
320. **C. gelidus** (Grd.) Jordan. Milk River. *d. s.*
321. **C. vernalis** (Grd.) Jordan. Arkansas River. *d. s.*
322. **C. aestivalis** (Grd.) Jordan. Rio Grand River. *d. s.*
323. **C. nubilus** (Grd.) Cope. Puget's Sound. *d. s.*

93. APOCOPE Cope, 1872.

§ APOCOPE.

324. **A. carringtonii** Cope. Utah.

§ ERITREMA Cope, 1876.

325. **A. henshawi** Cope. Utah, Idaho.
326. **A. vulnerata** Cope, Utah.
327. **A. oscula** (Grd.) Cope. Colorado, Utah, New Mexico.
328. **A. conesii** Yarrow. Arizona.
329. **A. ventricosa** Cope. Arizona, New Mexico.
330. **A. notabilis** (Grd.) Sonora. *d. s.*

94. RHINICHTHYS Agassiz, 1850.

331. **R. atronasus** (Mitch.) Ag. Great Lakes to New England and Ohio Valley and Southern States.
332. **R. lunatus** Cope. Michigan to Virginia. *d. s.*
333. **R. dulcis** (Grd.) Jordan. Sweetwater River.
334. **R. meleagris** Ag. Illinois and Iowa.
335. **R. maxillosus** Cope. Lake Michigan to Idaho, and South.
336. **R. marmoratus** Ag. Great Lakes. *d. s.*
337. **R. nasutus** (Ayres) Ag. New England to Virginia and Wisconsin.

95. AGOSIA Girard, 1856.

338. **A. chrysogaster** Grd. Sonora.
339. **A. metallica** Grd. Gila River.

96. PHENACOBIUS Cope, 1867.

340. **P. teretulus** Cope. Kanawha River to Tennessee.
341. **P. liosternus** Nelson. Illinois. *d. s.*
342. **P. uranops** Cope. Headwaters Tennessee and Alabama Rivers.

97. TIAROGA Girard, 1856.

343. **T. cobitis** Grd. Gila River.

98. ALGOMA Girard, 1856. *d. g.*

344. **A. amara** Grd. Texas.
345. **A. fluviatilis** Grd. New Leon.

99. TIGOMA Girard, 1856. *d. g.*

346. **T. conformis** (B. and G.) Grd. Tulare Valley, Cal.
347. **T. nigrescens** Grd. Rio Grande. *d. s.*
348. **T. caerulea** (Grd.) Gill. Oregon.
349. **T. bicolor** Grd. Oregon. *d. s.*
350. **T. obesa** Grd. Salt Lake Valley. *d. s.*
351. **T. squamata** Gill. Salt Lake Basin.
352. **T. crassa** Grd. Sacramento River. *d. s.*
353. **T. gibbosa** Grd. Gila River. *d. s.*
354. **T. purpurea** Grd. Gila River. *d. s.*
355. **T. pulchella** Grd. Gila River. *d. s.*

100. PROTOPORUS Cope, 1872.

356. **T. dominus** Cope. Idaho.

101. HYBOPSIS Agassiz, 1855.

§ HYBOBSIS.

357. **H. gracilis** Agassiz. Tennessee and South.
358. **H. microstomus** (Raf.) Jordan (syn. *H. longiceps* Cope). Ohio Valley to North Carolina.
359. **H. volucellus** Cope. Michigan, Wisconsin.
360. **H. spectrunculus** Cope. Tennessee to Georgia and Alabama.
361. **H. procne** Cope. Eastern Pennsylvania.
362. **H. scylla** Cope. Platte River.
363. **H. missouriensis** Cope. Missouri River, Mo.
364. **H. stramineus** Cope. Illinois to Michigan.
365. **H. tuditanus** Cope. Michigan, Indiana. *d. s.*
366. **H. dorsalis** Ag. Mississippi River, Iowa. *d. s.*

§ HUDSONIUS Girard, 1856.

367. **H. hudsonius** (Clinton) Putnam. Middle States.
368. **H. amarus** (Grd.) Cope. Marpland to Georgia. *d. s.*
369. **H. storerianus** (Kirt.) Ag. Great Lakes.
370. **H. niveus** Cope. Catawba River.

§ ALBURNOPS Girard, 1856.

371. **H. blennius** (Grd.) Jordan. Arkansas River.
372. **H. shumardii** (Grd.) Jordan. Arkansas River. *d. s.*
373. **H. illecebrosus** (Grd.) Jordan. Arkansas River. *d. s.*
374. **H. timpanogensis** Cope. Utah.

375. **H. xaenocephalus** Jordan (MSS. Fishes of Georgia). Alabama River.
376. **H. bivittatus** Cope. Utah.
377. **H. plumbeolus** Cope. Great Lakes.
378. **H. chlorocephalus** Cope. Catawba River.
379. **H. rubricroceus** Cope. Eastern Tennessee to North Carolina.
380. **H. chrosomus** Jordan (MSS. Fishes of Georgia). Alabama River.
381. **H. chilticus** Cope. Yadkin River.
382. **H. lacertosus** Cope. Holston River.
383. **H. chalybaeus** Cope. Schuylkill River.
384. **H. fretensis** Cope. Michigan to Illinois.
385. **H. haematurus** Cope. Lake Michigan.
386. **H. regius** (Grd.) Cope. Potomac River.

102. HEMITREMIA Cope, 1870.

387. **H. vittata** Cope. Kentucky, Tennessee, Virginia.
388. **H. heterodon** Cope. Michigan to Illinois and Wisconsin.
389. **H. bifrenata** Cope. Massachusetts to Maryland.

103. CHROSOMUS Rafinesque, 1820.

390. **C. erythrogaster** Raf. (syn. *C. oreas* and *C. eos* Cope; *C. pyrrhogaster* Jordan, representing color varieties). Wis. to Pa., Ky. and N. C.

104. PHOXINUS Rafinesque, 1820.

Type: Cyprinus phoxinus L.=Phoxinus laevis Ag (European.)

391. **P. neogaeus** Cope. Michigan, Wisconsin.

105. CHEONDA Girard, 1856.

392. **C. cooperi** Girard. Columbia River.

106. ALGANSEA Girard, 1856.

393. **A. tincella** (Val.) Grd. Mexico.
394. **A. intermedia** Grd. Gila River. *d. s.*
395. **A. antica** Cope. Texas.

107. SIBOMA Girard, 1856.

396. **S. crassicauda** Grd. San Joaquin River.
397. **S. atraria** Grd. Colorado, Idaho and South.

108. MYLOLEUCUS Cope, 1872.

398. **M. pulverulentus** Cope. Utah, Montana, etc.
399. **M. parovanus** Cope. Beaver River, Utah.

109. PTYCHOCHILUS Agassiz, 1855.

400. **P. oregonensis** (Rich.) Grd. Oregon and North.
401. **P. grandis** (Ayres) Grd. California.

402. **P. lucius** Grd. California. *d. s.*
403. **P. rapax** Grd. California. *d. s.*
404. **P. vorax** Grd. California. *d. s.*

110. *GILA Baird and Girard, 1853

§ GILA.

405. **G. robusta** B. and G. Arizona.
406. **G. grahami** B. and G. Arizona, New Mexico.
407. **G. gracilis** B. and G. Arizona.
408. **G. elegans** B. and G. Arizona, New Mexico.
409. **G. emoryi** Grd. Gila River.
410. **G. affinis** Abbott. Kansas. *d. s.*
411. **G. egregia** (Grd.) Cope. Colorado, Utah.
412. **G. nigra** Cope. Arizona.
413. **G. nacrea** Cope. Green River, Wyoming.
414. **G. seminuda** Cope and Yarrow. Rio Virgen.

§ CLINOSTOMUS Girard, 1856.

415. **G. elongata** (Kirt.) Jordan (syn. *C. proriger* Cope). Great Lakes and Ohio Valley.
416. **G. margarita** Cope. Eastern Pennsylvania.
417. **G. vandoisula** (Val.) Jordan (syn. *Clinostomus funduloides* Grd.). South Atlantic States.
418. **G. affinis** (Grd.) Cope and Yarrow. James River.
419. **G. phlegethontis** Cope. Beaver River, Utah.
420. **G. montana** Cope. Montana, Idaho and South.
421. **G. hydrophlox** Cope. Idaho.
422. **G. taenia** Cope. Utah.
423. **G. ardesiaca** Cope. Rocky Mountain Region.
424. **G. humboldtii** (Grd.) Cope. Humboldt River, Nevada.
425. **G. pandora** Cope. New Mexico.
426. **G. gula** Cope. New Mexico.

111. LYTHRURUS Jordan, 1876.

427. **L. diplaemius** (Raf.) Jordan. Ohio Valley and North.
428. **L. cyanocephalus** Copeland Mss. Wisconsin to Illinois.
429. **L. ardens** (Cope) Jordan. Kentucky to North Carolina.
430. **L. lirus** Jordan (MSS. Fishes of Georgia). Alabama River.

---

*We have just received, through the kindness of Lieut. George M. Wheeler, the proof-sheets of Cope and Yarrow's "Report upon the Collection of Fishes made in portions of Nevada, Utah, California, Colorado, New Mexico and Arizona," being a part of Lieut. Wheeler's Report on Surveys west of the 100th Meridan. In this report Prof. Cope shows that the current genera *Gila* and *Clinostomus* are not sufficiently distinct. We have here adopted this arrangement. The various species described as new in the above-mentioned report are incorporated into the present list.

112. LUXILUS Rafinesque, 1820.

(syn. *Hypsilepis* Baird, 1854.

431. **L. cornutus** (Mitch.) Jordan. New England to Wyoming and South.
432. **L. coccogenis** (Cope) Jordan. Upper Tennessee River.
433. **L. iris** (Cope) Jordan. Rio Grande. *d. a. g.*

113. CYPRINELLA Girard, 1856. *d. g.*

434. **C. bubalina** Grd. Red River.
435. **C. venusta** Grd. Texas.
436. **C. macrostoma** Grd. Texas and South.
437. **C. callistia** Jordan (MSS. Fishes of Georgia). Alabama River.
438. **C. stigmatura** Jordan (MSS. Fishes of Georgia). Alabama River.
439. **C. cercostigma** Cope. Mississippi.
440. **C. eurystoma** Jordan (MSS. Fishes of Georgia). Chattahoochee River
441. **C. pyrrhomelas** (Cope) Jordan. N. C. to Ga.
442. **C. analostana** Girard. Western N. Y. to Wis., Va. and Ky.
443. **C. galactura** (Cope) Jordan. Kentucky to Tennessee and Virginia.
444. **C. caerulea** Jordan (MSS. Fishes of Georgia). Alabama River.
445. **C. whipplii** Grd. Arkansas.
446. **C. beckwithii** Grd. Arkansas River.
447. **C. umbrosa** Grd. Arkansas.
448. **C. texana** Grd. Texas
449. **C. luxiloides** Grd. Texas.
450. **C. gunnisonii** Grd. Utah.
451. **C. suavis** Grd. Texas.
452. **C. ludibunda** Grd. Utah.
453. **C. lepida** Grd. Texas.
454. **C. notata** Grd. Texas.
455. **C. lugubris** Grd. Utah.
456. **C. billingsiana** Cope. Missouri River, Mo.
457. **C. jugalis** (Cope) Jordan. Missouri River, Mo.

114. MONIANA Girard, 1856. *d. g.*

458. **M. lutrensis** Grd. Arkansas.
459. **M. leonina** Grd. Texas.
460. **M. laetabilis** Grd. Texas.
461. **M. deliciosa** Grd. Texas.
462. **M. complanata** Grd. Texas.
463. **M. frigida** Grd. Texas.
464. **M. gibbosa** Grd. Texas.
465. **M. proserpina** Grd. Texas.
466. **M. aurata** Grd. New Mexico.

467. **M. gracilis** Grd. New Leon.
468. **M. formosa** Grd. Rio Mimbres.
469. **M. nitida** Grd. New Leon.
470. **M. rutila** Grd. New Leon.
471. **M. couchii** Grd. New Leon.
471. (b) **M. callisema** Joadan (MSS. Fishes of Georgia). Ocmulgee River.

*115. PHOTOGENIS Cope, 1866. *d. g.*

472. **P. leucops** Cope. Alleghany River and South.
473. **P. ariommus** Cope. White River, Ind.
474. **P. telescopus** Cope. Upper Tennessee.
475. **P. leuciodus** Cope. Upper Tennessee.
476. **P. scabriceps** Cope. Ohio Valley.
477. **P. spilopterus** Cope. Indiana, Mich.
478. **P. piptolepis** Cope. Platte River.

116. MINNILUS Rafinesque, 1820.

(syn. *Alburnellus* Grd., 1856.)

479. **M. dinemus** Raf.; (syn. *A. jaculus* Cope.) Mich. to Ills. and Tenn.
480. **M. lepidulus** (Grd.) Jordan. Black Warrior River. *d. s.*
481. **M. rubellus** (Ag.) Jordan. Great Lakes and Ohio Valley.
482. **M. dilectus** (Grd.) Jordan. Ohio Valley to Arkansas.
483. **M. amoenus** (Abbott) Jordan. Delaware River. *d. s.*
484. **M. rubrifrons** (Cope) Jordan. Ohio Valley.
485. **M. micropteryx** (Cope) Jordan. Cumberland River; Clinch River.
486. **M. formosus** (Putnam) Jordan. Mobile.
487. **M. altipinnis** (Cope) Jordan. Yadkin River.
488. **M. matutinus** (Cope) Jordan. Neuse River.
489. **M. umbratilis** (Grd.) Jordan. Arkansas.
490. **M. oligaspis** (Cope) Jordan. Kansas.
491. **M. lineolatus** (Ag.) Jordan. Osage River. *d. s.*
492. **M. zonatus** (Ag.) Jordan. Osage River. *d. s.*
493. **M. amabilis** (Grd.) Nelson. Illinois to Texas.
494. **M. megalops** (Grd.) Jordan. Georgia to Texas.
495. **M. socius** (Grd.) Jordan. Texas. *d. s.*
496. **M. percobromus** (Cope) Jordan. Missouri River, Mo.
497. **M. simus** (Cope) Jordan. Rio Grande, N. M.
498. **M. jemezanus** (Cope) Jordan. Rio Grande, N. M.

117. LAVINIA Girard, 1854.

499. **L. exilicauda** B. and G. California.
500. **L. harengus** Grd. California. *d. s.*

---

*Since the above was in type, I have been informed by Prof. Cope that *P. spilopterus* is to be considered as the true type of *Photogenis*. *P. leucops* and *P. ariommus*, belonging rather to *Minnilus*. *P. spilopterus* is certainly congeneric with some species referred to Cyprinella.

501. **L. gibbosa** Ayres. California. *d. s.*
502. **L. boscii** (Val.) Cope. South Carolina. *d. s. d. a. g.*

118. NOTEMIGONUS Rafinesque, 1819. *d. g.*

503. **N. americanus** (L.) Jordan. Maine to Minnesota and Wisconsin.
504. **N. occidentalis** (B. and G.) Jordan. California.
505. **N. seco** (Grd.) Jordan. Texas. *d. s.*
506. **N. ischanus** Jordan (Fishes of Georgia MSS.). Ockmulgee River.
507. **N. leptosomus** (Grd.) Jordan. Rio Grande.
508. **N. lucidus** (Grd.) Jordan. Indian Territory. *d. s.*

119. RICHARDSONIUS Girard, 1856.

509. **R. balteatus** (Rich.) British Columbia, etc.
510. **R. lateralis** Grd. Washington Territory. *d. s.*

120. MYLOCHILUS Agassiz, 1855.

§ MYLOCHILUS.

511. **M. lateralis** Ag. and Pick. Washington Territory.
512. **M. fraterculus** Grd. California. *d. s.*
513. **M. caurinus** (Rich.) Grd. Oregon and North.

§ MYLOPHARODON Ayres, 1855.

513. **M. robustus** (Ayres) Grd. California. *d. s.*
514. **M. conocephalus** (B. and G.) Gill.

121. CARASSIUS Nilsson, 18—.

Type: Cyprinus carassius L.=Carassius vulgaris Nilsson. (European.)

515. **C. auratus** (L.) Bleeker. Introduced eastward.

122. CYPRINUS Linnaeus, 1748.

516. **C. carpio** L. Introduced eastward.

123. PLAGOPTERUS Cope, 1874.

517. **P. argentissimus** Cope. San Luis Valley, Western Colorado.

124. MEDA Girard, 1856.

518. **M. fulgida** Grd. Arizona.

125. LEPIDOMEDA Cope, 1874.

519. **L. vittata** Cope. Colorado, Arizona.
520. **L. jarrovii** Cope. Colorado.

CATOSTOMIDAE.

126. CATOSTOMUS Le Sueur, 1817.

{ Acomus and Minomus Girard, 1856.

521. **C. longirostrum** Le Sueur; (syn. *C. hudsonius* Le Sueur.) Great Lakes and North.
522. **C. forsterianus** Rich. (syn. *Cat. aurora* Ag.). Great Lakes, Upper Mississippi and North. *d. s.*
523. **C. griseus** Grd. Sweet Water River.
524. **C. lactarius** Grd. Milk River. *d. s.*
525. **C. generosus** Grd. Utah.
526. **C. teres** (Mitch.) Le S. Maine to Great Plains.
527. **C. occidentalis** Ayres. California.
528. **C. labiatus** Ayres. Klamath Lake.
529. **C. macrochilus** Grd. Oregon.
530. **C. suckleyi** Grd. Milk River.
531. **C. alticolus** Cope. Twin Lakes, Col.
532. **C. discobolus** Cope. New Mexico, Arizona.
533. **C. fecundus** Cope and Yarrow. Utah Lake.
534. **C. latipinnis** (Grd.) Cope. Gila River.
535. **C. guzmaniensis** (Grd.) Cope. Utah Lake.
536. **C. texanus** Abbott. Colorado River.
537. **C. chloropterus** Abbott. Kansas. *d. s.*
538. **C. clarkii** B. and G. Rio Santa Cruz.
539. **C. plebejus** B. and G. Gila River.
540. **C. insignis** B. and G. Arizona, New Mexico.

127. PANTOSTEUS Cope, 1876.

541. **P. platyrhynchus** Cope. Proro River, Utah.
542. **P. yarrowi** Cope. Colorado and New Mexico.
543. **P. virescens** Cope. Arkansas River.
544. **P. dolphinus** Cope. Colorado River.
545. **P. bardus** Cope. Colorado River.

128. HYPENTELIUM Rafinesque, 1820. *d. g.*

(syn. *Hylomyzon* Agassiz, 1855.)

546. **H. nigricans** (Le S.) Jordan. New York to Minnesota and South.

129. *ERIMYZON Jordan, 1876.

(syn. *Moxostoma* Agassiz, 1854—not of Raf., 1820.)

547. **E. oblongus** (Mitch.) Jordan. New England to Illinois, Texas and S.
548. **E. tenuis** (Ag.) J. and C. Alabama. *d. s.*
549. **E. claviformis** (Grd.) J. and C. Canadian River. *d. s.*.
550. **E. campbelli** (Grd.) J. and C. Texas. *d. s.*
551. **E. sucetta** (Lac.) Jordan. South Carolina to Florida.
552. **E. melanops** (Raf.) Jord. Great Lakes to Texas.
553. **E. trisignatus** (Cope) J. and C. Rocky Mountains.

130. TERETULUS Rafinesque, 1820.

Syn. *Ptychostomus* Agassiz, 1855.

Type: Cat. aureolus Le Sueur.

Syn. *Moxostoma* Rafinesque, 1820.

Type: C. anisurus Raf.

554. **T. aureolus** (Le S.) Nels. Great Lakes and N. W.
555. **T. crassilabris** (Cope) J. and C. Neuse River. *d. s.*
556. **T. breviceps** (Cope) J. and C. Ohio River. *d. s.*
557. **T. conus** (Cope) J. and C. Yadkin River.
558. **T. robustus** (Cope) J. and C. Yadkin River.
559. **T. macrolepidotus** (Le S.) Nels. New Jersey to Illinois.
560. **T. lachrymalis** (Cope) J. and C. North Carolina to Alabama. *d. s.*
561. **T. erythrurus** (Raf.) J. and C. Ohio Valley and South. *d. s.*
562. **T. duquesnii** (Le S.) Cope. Ohio Valley and Lakes. *d. s*
563. **T. carpio** (Val.) Nelson. Great Lakes and Wisconsin.
564. **T. sueurii** (Rich.) J. and C. British America. *d. s.*
565. **T. haydeni** (Grd.) J. and C. Upper Missouri River.
566. **T. bucco** (Cope) J. and C. Missouri River, Mo.
567. **T. euryops** Jordan (MSS. Fishes of Georgia). Alabama River.
568. **T. albidus** (Grd.) J. and C. Texas. *d. s.*
569. **T. congestus** (Grd.) J. and C. Texas, Arizona.
570. **T. cervinus** Cope. Virginia to Florida.

---

* The name *Moxostoma* cannot properly be used for this genus, as I have elsewhere shown. The Catostomus (Moxostoma) anisurus of Rafinesque is evidently a "Red Horse" or *Teretulus* of some sort. The *Catostomus anisurus* of Dr. Kirtland is figured with a lateral line, and Dr. Kirtland informs me that his fish is *not* the *Cyprinus oblongus* of Dr. Mitchell but a large-scaled silvery "mullet-like" fish; in his opinion and mine undoubtedly the *Ctychostomus collapsus* of Cope. Dr. Kirtland tells me that he was imperfectly acquainted with the *oblongus*, when his Catalogue of Ohio Fishes was published, and that having no good specimens, he decided to omit it. Later, in the Family Visitor, he correctly described and figured it as *Catostomus gibbosus* Le Sueur. The specimen figured is now in the possession of the writer. The type of *Esox umbrosus* Kirt. is now in my possession. It is identical with the species for which I have accepted the name of Esox or *Picorellas salmoneus* Raf.—D. S. J.

571. **T. velatus** (Cope) Nelson. Pennsylvania to Illinois.
572. **T. anisurus** (Raf.) Nelson; (syn. *Ptychostomus collapsus* Kirt.) Ohio Valley and West.
573. **T. pediensis** (Cope) J. and C. Yadkin River.
574. **T. coregonus** (Cope) J. and C. North Carolina.
575. **T. albus** (Cope) J. and C. Catawba River.
576. **T. thalassinus** (Cope) J. and C. Yadkin River.
577. **T. pappillosus** (Cope) J. and C. Virginia to Florida.

131. PLACOPHARYNX Cope, 1870.

578. **P. carinatus** Cope. Wabash River.

132. CARPIODES Rafinesque (Ich. Oh. p. 56), 1820. *d. g.*

579. **C. cyprinus** (Le S.) Ag. Pennsylvania to Virginia.
580. **C. carpio** Raf.; (syn. *C. nummifer* Cope.) Ohio Valley to Illinois.
581. **C. damalis** Grd. Platte River.
582. **C. bison** Ag. Mississippi Valley.
583. **C. thompsoni** Ag. Great Lakes.
584. **C. grayi** Cope. New Mexico.
585. **C. velifer** (Raf.) Ag. Ohio Valley.
586. **C. difformis** Cope. Ohio River.
587. **C. cutisanserinus** Cope. Ohio River, Great Lakes.
588. **C. selene** Cope. Michigan. *d. s.*

133. ICHTHYOBUS Rafinesque (Ich. Oh. p. 55), 1820.

589. **I. bubalus** (Raf.) Ag. Mississippi Valley.
590. **I. cyprinella** (Val.) Ag. Louisiana.
591. **I. cyanellus** Nelson. Illinois to Iowa and Missouri.
592. **I. rauchii** Ag. Mississippi River, Iowa.
593. **I. stolleyi** Ag. Osage River. *d. s.*
594. **I. tumidus** B. and G. Texas.
595. **I. ischyrus** Nelson (MSS.). Illinois River.

134. BUBALICHTHYS Agassiz, 1855.

596. **B. urus** Ag. Tennessee River.
597. **B. niger** (Raf.) Ag. Mississippi Valley.
598. **B. bubalus** (Kirt.) Ag. Mississippi Valley.
599. **B. taurus** Ag. Mobile River.
600. **B. vitulus** Ag. Wabash River. *d. s.*
601. **B. bonasus** Ag. Osage River. *d. s.*

135. CYCLEPTUS Rafinesque, 1820

602. **C. elongatus** (Le S.) Ag. Mississippi Valley.

SILURIDAE.

136. ICTALURUS Rafinesque, 1820.

603. **I. punctatus** (Raf.) Jordan; (syn. *Ictalurus caerulescens*). Ohio Valley, Great Lakes.
604. **I. olivaceus** (Grd.) Gill. Upper Missouri. *d. s.*
605. **I. simpsoni** Gill. Big Sandy River, Kansas. *d. s.*
606. **I. furcifer** (Val.) Gill. Mississippi Valley. *d. s.*
607. **I. furcatus** (Val.) Gill. Mississippi Valley.
608. **I. gracilis** (Hough) Gill. Northern New York.
609. **I. beadlei** Gill. Canada. *d. s.*
610. **I. affinis** (B. and G.) Gill. Rio Grande River. *d. s.*
611. **I. vulpes** (Grd.) Gill. Texas. *d. s.*
612. **I. megalops** (Grd.) Gill. Alabama. *d. s.*

137. AMIURUS Rafinesque, 1820.

613. **A. cupreus** (Raf.) Gill. Great Lakes to Georgia and S. W.
614. **A. catus** (L.) Gill. South Carolina.
615. **A. coenosus** (Rich.) Gill. Great Lakes and North.
616. **A. felinus** (Grd.) Gill. Arkansas. *d. s.*
617. **A. antoniensis** (Grd.) Gill. Texas. *d. s.*
618. **A. lividus** (Raf.) Jordan. (syn. *Amiurus cupreoides* (Grd.) Gill). Kentucky to Illinois. *d. s.*
619. **A. atrarius** (Dek.) Gill. Great Lakes to Pennsylvania and N. Eng.
620. **A. albidus** (Le S.) Gill. New Jersey to Colorado and South.

VARIETIES?

A. nebulosus (Le S.) Gill. Great Lakes and Miss. Valley.
A. exanthocephalus (Raf.) Gill. Ohio River.
A. melas (Raf.) J. and C. Falls of the Ohio.
A. catulus (Grd.) Gill. New York to Arkansas.
A. obesus Gill. Nebraska.
A. mispilliensis Cope. Mispillion Creek, Delaware.

621. **A. vulgaris** (Thomson) Nelson. Great Lakes.
622. **A. aelurus** (Grd.) Gill. Mississippi Valley.
623. **A. platycephalus** (Grd.) Gill. North Carolina to Georgia.
624. **A. vulpeculus** (Grd.) Gill. South Carolina to Florida.
625. **A. felis** (Ag.) Gill. Great Lakes. *d. s.*
626. **A. puma** (Grd.) Gill. South Carolina. *d. s.*
627. **A. hoyi** (Grd.) Gill. Racine, Wis. *d. s.*
628. **A. confinis** (Grd.) Gill. Racine, Wis. *d. s.*
629. **A. borealis** (Rich.) Cope. Lakes of British America.
630. **A. nigricans** (Le S.) Gill. Great Lakes.

631. **A. niveiventer** Cope. Neuse River.
632. **A. lyrx** (Grd.) Gill. Pennsylvania to Virginia and South.
633. **A. lophius** (Grd.) Gill. Potomac River.

138. GRONIAS Cope, 1864.

634. **G. nigrilabris** Cope. Caves in Southeastern Pennsylvania.

139. NOTURUS Rafinesque, 1818.

635. **N. flavus** Rafinesque. Ohio Valley, etc.
636. **N. gyrinus** (Mitchell) Raf. E. Pennsylvania and S. E. New York.
637. **N. leptacanthus** Jordan. Alabama River.
638. **N. lemniscatus** (Le Sueur) Grd. Southern States.
639. **N. marginatus** Baird. Ohio Valley to North Carolina.
640. **N. miurus** Jordan. French Broad River.
641. **N. exilis** Nelson. Illinois, Wisconsin.
642. **N. occidentalis** Gill. Platte River.
643. **N. platycephalus** Gunther. North America.

140. HOPLADELUS Rafinesque, 1818.

644. **H. olivaris** (Raf.) Gill. Ohio Valley and South.

ANGUILLIDAE.

141. ANGUILLA Thunberg, 179–.

645. **A. vulgaris** Fleming (Dareste). Entire Northern Hemisphere, in nearly all waters.

AMIIDAE.

142. AMIA Linnaeus, 1766.

636. **A. calva** L. Great Lakes to Lake Champlain, South and West.

LEPIDOSTEIDAE.

143. LEPIDOSTEUS Lacepede, 1803.

§ LEPIDOSTEUS.

647. **L. osseus** (L.) Ag. Great Lakes to Lake Champlain, South and West.

§ CYLINDROSTEUS Rafinesque, 1820.

748. **L. platystomus** Raf. Great Lakes to Lake Champlain, S. and W.

144. **LITHOLEPIS** Rafinesque, 1818.

(syn. *Atracrosteus* Raf., 1820.)

649. **L. adamantinus** Raf. Lower Mississippi.

POLYODONTIDAE.

145. **POLYODON** Lacepede, 1798.

650. **P. folium** Lac. Mississippi Valley.

ACIPENSERIDAE.

146. **ACIPENSER** Linnaeus, 1748.

Type: A. sturio L. marine.

651. **A. rubicundus** Le S. Great Lakes and Western Rivers.
652. **A. maculosus** Le S. Ohio River and Great Lakes.
653. **A. transmontanus** Rich. Columbia River.
654. **A. rupertianus** Rich. British America.

147. ***SCAPHIRHYNCHOPS** Gill, 187–.

(syn. *Scathirhynchus* Heckel, 1835; preocupied.)

655. **S. platyrhynchus** (Raf.) Cope. Mississippi Valley and S. W.

PETROMYZONTIDAE.

148. **PETROMYZON** Linnaeus, 1766.

Type: P. marinus L. (Europe.)

656. **P. nigricans** Le S. Eastern streams and Coast.
657. **P. niger** Raf. Upper Great Lakes to Ohio Valley.
658. **P. tridentatus** Gairdner. California and North.
659. **P. lividus** Girard. Oregon.
660. **P. borealis** Grd. Great Slave Lake.
661. **P. hirudo** (Grd.) Nelson. Lake Erie to Arkansas.
662. **P. argenteus** Kirtland. Great Lakes, Ohio Valley.
663. **P. castaneus** (Grd.) J. and C. Minnesota.

---

* *Scaphirhychops* Gill, MSS. This name was proposed in manuscript by Prof. Gill some years ago as a substitute for *Scaphirhynchus* Heckel, preocupied in Ornithology. Scaphirhynchops has been employed by several authors, but thus far without explanation.

SUPPLEMENT.

Pages 133 to 136 of this list were printed in May, 1876, some eight months previous to its completion. In the meantime, the authors have been enabled to examine quite a number of doubtful species, and they propose to substitute the following for the list of "Etheostomidae" on pages 134 and 135:

1. MICROPERCA Putnam, 1863.

1. **M. punctulata** Putnam. Wisconsin to Alabama.

2. ALVARIUS Girard, 1859.

2. **A. lateralis** Grd. Rio Grande Region.

3. CATONOTUS Agassiz, 1854. *d. g.*

3. **C. lineolatus** Ag. Illinois, Wisconsin. *d. s.*
4. **C. flabellatus** (Raf.) Putn. Ohio Valley.
5. **C. kennicotti** Putn. S. Illinois. *d. s.*
6. **C. linslii** (H. R. Storer) Le V. W. N. Y. and C. *d. s.*

4. POECILICHTHYS Agassiz, 1854.

7. * **P. variatus** (Kirt.) Agassiz (syn. *P. caeruleus* (Storer) Ag.)
8. **P. spectabilis** Ag. Ohio to Missouri and N. *d. s.*
9. **P. zonalis** Cope. Indiana to Tennessee.
10. **P. rufilineatus** Cope. French Broad River.
11. **P. vulneratus** Cope. French Broad River.
12. **P. niger** (Raf.) Jordan. (syn. *P. camurus* Cope). Ohio Valley, Cumberland River.
13. **P. sanguifluus** Cope. Cumberland River.
14. **P. punctulatus** Ag. Missouri and S. W. *d. s.*
15. **P. pottsii** (Grd.) Jordan. Chehuahua River.
16. **P. mesaeus** Cope. Kansas. *d. a. g.*
17. **P. cinereus** (Storer) Jordan. Tennessee River. *d. a. g.*
18. **P. tessellatus** (Storer) Jordan. Tennessee River. *d. a. g.*
19. **P. pulchellus** (Grd.) J. and C. Canadian River. *d. s.*

---

* Specimens of undoubted P. caeruleus have been fully identified by Dr. Kirtland with his *Etheostoma variata*. The nomenclature of this species will be discussed elsewhere.

20. **P. lepidus** (Grd.) J. and C. Texas. *d. s.*
21. **P. leonensis** (Grd.) J. and C. Texas. *d. s.*
22. **P. grahami** (Grd.) J. and C. Texas. *d. s.*

5. BOLEICHTHYS Girard, 1859.

23. **B. exilis** Grd. Wisconsin to Upper Missouri.
24. **B. eos** Jord. Wisconsin, Illinois.
25. **B. warreni** Grd. Upper Missouri.
26. **B. elegans** Grd. Georgia to Texas.
27. **B. barrattii** (Holbr.) Jord. South Carolina.
28. **B. erochrous** (Cope) Jord. New Jersey.
29. **B. fusiformis** (Grd.) Jord. Massachusetts.

6. PLEUROLEPIS Agassiz, 1863.

30. **P. pellucidus** Ag. Ohio Valley.
31. **P. vitreus** (Cope.) J. and C. French Broad and Neuse Rivers. *d. a. g.*

7. BOLEOSOMA Dekay, 1842.

32. **B. olmstedi** (Storer) Ag. New England and Great Lakes.
33. **B. brevipinne** Cope. Mississippi Valley and N. *d. s.*
34. **B. effulgens** (Grd.) Cope. Virginia to North Carolina. *d. s.*
35. **B. maculaticeps** Cope. Catawba River. *d. s.*
36. **B. aesopus** Cope. Allegheny River. *d. s.*
37. **B. tessellatum** Thompson Putnam. Lake Champlain. *d. s.*
38. **B. faciatum** (Grd.) Jord. Chihuahua River. *d. a. g.*
39. **B. gracile** Grd. Chihuahua River.

8. DIPLESIUM Rafinesque, 1820.

(Syn. *Hyostoma* Agassiz, 1854.)

40. **D. blennioides** Raf. Ohio Valley and W.
41. **D. simoterum** (Cope) Copeland. Kentucky and Tennessee.
42. **D. newmani** (Ag.) Jord. Georgia and Alabama.

9. ETHEOSTOMA Rafinesque, 1820.

§ ETHEOSTOMA.

43. **E. blennioides** Ag. Ohio Valley and N.
44. **E. phoxocephalum** Nelson. Illinois.

45. **E. maculatum** (Grd.) Cope. Pennsylvania to North Carolina.
46. **E. macrocephalum** Cope. Youghiogheny River.
47. **E. peltatum** Stauffer. E. Pennsylvania. *d. a. g.*
48. **E. shumardii** (Girard) J. & C. Arkansas.
49. **E. nevisense** Cope. Neuse River.
50. **E. evides** Jordan and Copeland (sp. nov.). White River, Indiana.

(Syn. *E. nigrofasciatum* Jordan, Man. Vert., not *H. nigrofasciatus* Ag.

§ HADROPTEROS Agassiz, 1854.

51. **E. nigrofasciatum** (Ag.) Jord. Georgia, Alabama.

§ HYPOHOMUS Cope, 1870.

52. **E. aurantiacum** (Cope) Le Vaillant. French Broad River.

10. PERCINA Haldeman, 1842.

53. **P. caprodes** (Raf.) Grd. Vermont to Texas.

SEPTEMBER 1, 1876.

The President in the chair. Eighteen members present.

The following were elected Corresponding Members:

Gustavus Heinrichs, Iowa City, Iowa.

Albert H. Larkin, Alfred University, Alfred, N. Y.

Heinrich Frauberger, Brunn, Austria.

Dr. Emil Brugsch, Albert Daninos and A. Behmer, all of Cairo, Egypt.

Dr. Rudolph Koenig, Paris, France.

Sir Redmond Barry, Melbourne, Australia.

Wilhelm Sagel, Vienna, Austria.

Dr. Theo. Nordstrom and Dr. Otto Torrell, Stockholm, Sweden.

Dr. E. H. Von Baumhauer, Haarlem, Netherlands.

Alessandro Castellani, Rome, Italy.

Dr. Hugo Hamberg and Dr. Josua Lindahl, Sweden.

Mr. GROTE gave the regular notice that at the next meeting there would be an election for an Honorary Member.

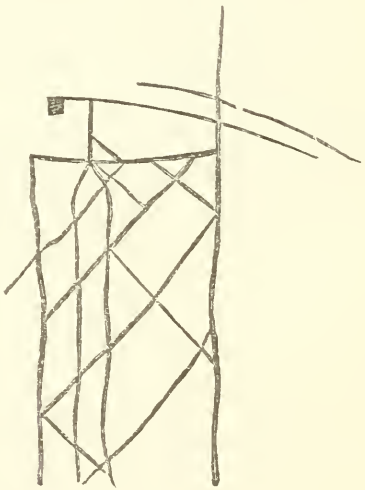
October 6, 1876.

Vice-President Henry Chandler in the chair. Thirteen members present.

Hon. William B. Rogers, of Boston, was elected an Honorary Member.

Letters were read from Dr. E. H. Von Baumhauer, Alessandro Castellani, Wilhelm Sagel, Dr. Hugo Hamberg, A. Daninos, A. Behmer, acknowledging their election as Corresponding Members of the Society.

Mr. Grote exhibited a drawing (see annexed figure) made by Mr. F. S. Dellenbaugh from a rock inscription in Glen Cañon in



the Basin of the Colorado. It resembled a swipe or the Egyptian shadoof, and might possibly represent an instrument for elevating water to the ledges used for cultivation or cliff dwellings.

DECEMBER 1, 1876.

The President in the chair. Twenty-two members present.

The following resolution was presented, both before the Society and the Executive Board, and passed:

Resolved, That the Committee recently appointed to take steps toward placing the Society on a more permanent basis, do inquire and report at a meeting of this Society, to be held three weeks from date, what, if any, changes are desirable in the mode of organization of the Society.

A paper entitled "The Shinumos—A Pre-Historic People of the Rocky Mountain Region," was then read by Mr. F. S. DELLENBAUGH, and, after discussion, was referred to the Publication Committee.

XI. The Shinumos—A Pre-Historic People of the Rocky Mountain Region

BY F. S. DELLENBAUGH.

It may be well to explain, in the beginning, that I designate all that elevated and distorted portion of the United States embraced between the Rocky Mountain range proper, and the Sierra Nevada, as the "Rocky Mountain Region;" and, in order that I may be more clearly understood, I quote a paragraph from the "Report on the Geology of the Uinta Mountains," by J. W. Powell:

"That portion of the United States west of the 100th meridian lies at a great altitude above the sea. The exceptions to this, as immediately along the Pacific coast and the narrow valleys of some of the principal streams, are but trivial. The rivers descend so rapidly from the upper regions that few of them are of value as highways of commerce; the valleys proper are narrow; treeless plains, cold, arid table-lands, and desolate mountains, are the principal topographic features. The more conspicuous of these are the mountains; lone mountains, single ranges, and great groups of ranges, or systems of mountains, prevail. Owing to great and widely-spread aridity, the mountains are scantily clothed with vegetation, and the indurated lithologic formations are rarely masked with soils; and the rocks, as they are popularly called, are everywhere exposed; hence, all these mountains are popularly known as the Rocky Mountains. But there is more than one system of mountains; and later writers, wishing to be more definite, speak of the Cascade Mountains, the Coast Ranges, the Sierra Nevada, the Wasatch Mountains, etc. But in an important sense the region is a unit; it is the generally-elevated region of the United States; it is the principal region of the precious metals; it is the region without important navigable streams; it is the arid land of our country, where irrigation is necessary to successful agriculture. But, above

all, it is the rocky region; rocks are strewn along the valleys, over the plains and plateaus; the cañon walls are of naked rock; long escarpments or cliffs of rock stand athwart the country, and everywhere are mountains of rock. It is the Rocky Mountain region."

Almost the whole section thus described abounds in remains of varied antiquity, of which the world was scarcely aware till within a comparatively recent period. The Spanish explorers through the region that is now comprised in New Mexico and Arizona, returned with reports of numerous ruined cities, and of strange races dwelling there; and expeditions to the same region, under the direction of our own government, gave accounts of extensive ruins, and described, also, curious people, semi-civilized, whom they supposed to be remnants of the race that had constructed the many cities they found deserted and in ruins.

Strange to say, these reports received but little attention, and aroused little desire to visit and investigate the ruined towns and the remnant of the ancient people.

The uninviting, desert nature of the country, and the notorious barbarity of the Navajo and Apache tribes, whose war-trails crossed every avenue of approach, offered more serious obstacles to the study of this remnant of antiquity than the ordinary student of ethnology cared to encounter. Gradually, however, journeys to that region became less hazardous; and as fresh discoveries of prehistoric ruins were made north of the Colorado River, more attention was drawn to the Southwest, and the interest in the almost unknown race, and their probable ancestors, was strongly revived.

These remnants, as I have called them, have been generally spoken of as the *Pueblo Indians*, though they are quite different from the tribes commonly understood by the term Indians. The seven towns known as the Moquis villages, are, in all probability, at this date, the most distinctly original; for, until very recently, they were even more isolated than any others, in a manner that tended to preserve to the present people the customs of their forefathers.

Most of what is now known of them has been gleaned from the writings of a few visitors, who made only hasty and necessarily imperfect observations. It is quite certain, that to speak with confidence one should have the experience of long intercourse with such a peculiar people, for, naturally enough, they are suspicious of

strangers whom they do not understand, and are not inclined to show them favors, much less to trust them with what they consider important secrets that might be used to their disadvantage. It is easy to understand, therefore, why different accounts sometimes disagree.

The title of "*Moquis*" has been applied to this confederacy by its enemies, and signifies the dying race. I understand that they usually speak of themselves as "*Ho-pees*" (our people.) I have referred to them and their kindred, because they are at present supposed to be the last of the once large family of which the Shinumos formed an important part, and because it is from them that the name "Shinumo" has been learned. They speak of the Shinumos as having occupied the country to the northward, and of having been exceedingly numerous and thrifty.

The following bit of Moquis history, or tradition, as it may be, which was told me by Jacob Hamblin, a shrewd Mormon, who has spent nearly his whole life in intimacy with Indians, and who has visited the Moquis villages at least annually for the last twenty years, is worthy of some attention, as it suggests very good reasons for the mysterious disappearance of the entire Shinumo nation.

"When the Shinumos found themselves enjoying such extreme prosperity they became reckless—grew corrupt; wickedness spread to an alarming extent. Suddenly, there appeared amongst them three emissaries from the sun, who passed from town to town, and house to house, and pronounced a curse on them. Disaster followed close upon these terrible angels. Crops failed and famine was at hand. A pestilence broke out and carried them off rapidly, until little was left of them except their tenantless habitations."

This story of famine and pestilence strengthens my idea that they were among the prime agents in the downfall and subsequent obliteration of the race. The Rocky Mountain region, doubtless always exceedingly dry and unfavorable to agriculture, was rendered much more so, perhaps, by some great physical changes. The inhabitants, not understanding the science of irrigation, beheld their crops slowly but surely failing every year. The production was not equal to the demand. The inevitable result was famine. By this their hardy constitutions were weakened, and the way was prepared for some great epidemic that swept away thousands and

left them in a melancholy condition. Then the epidemic was, possibly, soon followed by the appearance of the Indian, so entirely different from the Shinumo. His home was wherever night overtook him, with nothing more than a cedar bough for a canopy. A squirrel, a rabbit, a few seeds or roots—anything that would support life was sufficient for his repast. The little clothing he needed was easily obtained by fastening together a few skins. He was ferocious, treacherous, cunning. Lying, cheating, stealing, murdering, were his pastimes. Then, it is no wonder that the Shinumo, in his emaciated condition, was compelled to retreat before the impetuous attack of such a foe. He was no warrior—no hunter. He had depended almost entirely on his knowledge of agriculture for his peaceful existence. It was impossible for him to act on the defensive, and at the same time successfully till the soil. The Indian was constantly on the alert to surprise him. There was no alternative. He must fall back and yield more territory to the exacting intruder. Vanquished and discouraged he fortified himself in places extremely difficult of access; built cliff houses; lived in caves, and, finally, became extinct. The divisions on the south side of the Colorado fared somewhat better, for the stupendous chasms of the river form a barrier that can only be crossed with success at several widely separated points. Consequently when the Indian reached this obstacle, his easy progress southward was interrupted. The crossing points, too, which of course were well known to the Shinumos, had been strongly fortified by their soldiery, and thus a double check was presented to the invasion. The people then enjoyed comparative peace, till, in the course of their nomadic wanderings, the Indians discovered that there was an end to the cañon barrier, and were once more able to cope with their antagonists under favorable auspices. The Shinumos were again slowly driven back, and at the dawn of our knowledge of the region we find surviving only a mere handful of their kindred, in the Pueblo tribes, who were still defending their fortress homes, as they had been for centuries. And, determined to maintain their independence till the last, they yield nothing without a severe struggle.

The surrounding wild tribes—the Navajos, Apaches, etc.—are now compelled by the United States government to remain on

limited territory reserved for them, and the Moquis will probably be allowed to die in peace. Their towns, which are built of stone and adobe, on lofty mesas, will slowly crumble, as the inhabitants decrease in numbers, and eventually another series will be added to the ruins of the Rocky Mountain region.

Some of the existing ruins are in a comparatively good state of preservation. They are what may be termed the *recent* ruins. That is, they are the remains of those dwellings which were last occupied. But what time has elapsed since they were abandoned is unknown. I should say not *less* than two hundred years for those immediately along the Colorado and San Juan rivers; while others farther north, that are almost shapeless masses of debris, are certainly, at the very least, five hundred years old; even a thousand years does not appear irrational. Weathering, in the Rocky Mountain region, is an exceedingly slow process, especially in the valleys.

Some of the least disintegrated ruins that I remember are situated on the Colorado, only a short distance below the mouth of the Dirty Devil River. The cañon walls at this point are low, and beaten trails that lead down on both sides indicate that it was an old and well-known crossing. The ruins, then, were doubtless once the stronghold of a Shinumo outpost. The most prominent building stood upon a cliff—a rocky promontory rising about two hundred feet above the river on the south side. At the base was a long narrow strip of alluvial soil, fringed by willows, and two or three feet above ordinary high-water mark.

This must have been cultivated by the inhabitants of the houses; for by this time they must have learned to utilize the water of the river in fostering their crops, and were not entirely dependent on the scanty rainfall. Broken pottery, chips of chalcedony, and fragments of arrowheads, were strewn thickly about, but more particularly immediately at the foot of the cliff. The summit was gained by ascending a talus and huge fragments of the topmost stratum.

The situation was admirably adapted for defense, and commanded an extensive view in every direction. The lookout house, standing almost upon the brink of the precipice, was red sandstone, rectangular, and some eighteen feet long. It had been two stories high. Three walls, twelve or thirteen feet in height, still remained stand-

ing, and the accurate lines of the angles were remarkable. The fourth wall had fallen in and covered the floor of the building with a compact mass of rocks. Not a stick of timber could be found; but the sockets of the cross-beams were still distinct. Of the mortar, which was most likely the kind ordinarily used—clay and fine sand—not a trace was left.

The broad blocks of sandstone on which the house stood, and most of the smooth faces in the vicinity, were covered with inscriptions; accounts, probably, of notable events which had occurred here.

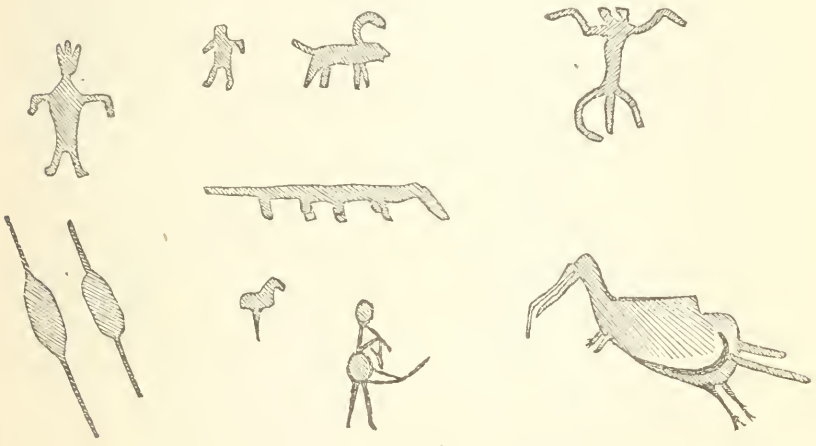


Fig. I.

But it was just beneath the uppermost stratum of the cliff that the main portion of the fortification was discovered. Nature had assisted the Shinumos in forming a cozy retreat. A level shelf, varying from about six to ten feet in width, ran along for a hundred and fifty feet or more. In most places the rocks above protruded as far as the edge of the lower rocks—sometimes further—thus leaving a sort of gallery, generally seven or eight feet high. Walls that extended to the roof had been built along the outer edge of the natural floor, and the enclosed space being subdivided by stone

partitions, to suit the convenience of the builders, the whole formed a series of rather comfortable rooms, or houses. At some points, where the upper rocks did not project quite far enough for a roof, an open balcony was left. The back walls of the houses—the natural rock—had on them many groups of hieroglyphics; and further along, where there was no roof-rock at all, the vertical faces had been inscribed with seeming great care. Some of the sheltered groups were painted in various dull colors, but most of them were chiselled.

Fig. I gives a chiseled group. It is easy to see that these are designs of no low order. Considering their great age, their exposure, many of the delicate touches must be obliterated. Suppose we cut a figure in the bark of a tree with careful accuracy. After many years we return and are astonished when we gaze on the distorted shape. Can it be the same symbol that long before was carved with such skillful delineation? The Shinumo cut his design in

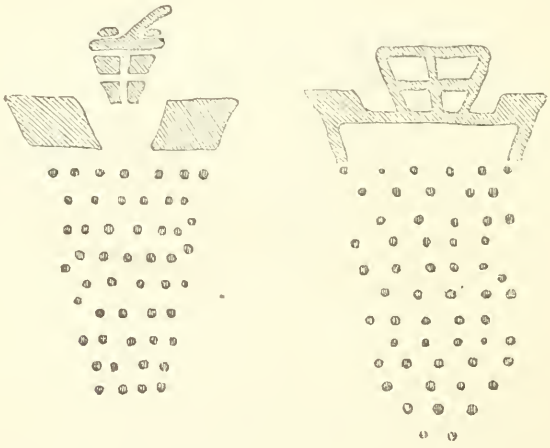


Fig. II.

stone; could he return and review his work now, might he not also be astonished at its different and blotted appearance? As the tree grew, so the stone was eroded; several years in the first case, several hundred in the second.

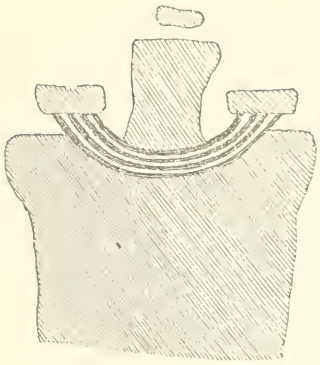


Fig. III.

Figs. II, III and IV are painted, and are some of the most curious I have ever seen. Probably considerable of the detail has been worn away, and we have left only an imperfect design.

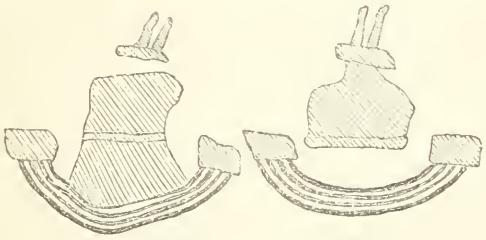


Fig. IV.

It cannot be determined whether these groups of drawings are historical records or not, till we become intimately acquainted with the descendants of the people who made them, and till they receive much patient study. It would seem, however, that if a people had the ability to represent *objects* by sketches and paintings, that they would soon discover that by certain combinations of these they could represent *ideas;* that they could record for the benefit of posterity their great migrations, battles, misfortunes. The inscriptions at this ruin might possibly be the history of the defense of

the crossing, the stationing of the garrison, the death of officers of rank, etc. They were interesting—fascinating. The whole locality was full of mystery, and it was with the greatest reluctance that we took our departure.

Not only at points where the cañons can be crossed, however, do ruins exist. In the Grand Cañon, in nooks that appear inaccessible from the country more than six thousand feet above, fallen walls can be found, overgrown by huge cacti and thorny mesquite. Every patch of alluvium seems to have been taken advantage of by this doomed people. Their store-caves may be discovered along the cliffs, or in the solitude of the lateral cañons.

Of course the ruins north of the Colorado are much more disintegrated than those just described, on account of their greater age. I have walked over many that could scarcely be distinguished without digging. Oftentimes the ground where a village once stood will be thickly covered with the old building stones, sand, broken pottery and fragments of grinders—a confused mass extremely puzzling to the inexperienced. But upon digging below the debris the walls are often found to be well preserved, even to the clay mortar, and the topography of the village can be accurately obtained. Among adobe ruins it is different; for clay is not lasting like stone. Yet I have seen *modern* adobe houses, in that region, from which the roofs had been stripped when they were abandoned, eight or ten years before, and it was astonishing to note what a slight effect those eight or ten years of exposure had produced on the bare walls. It was my impression that they might stand *a hundred years* without losing their outline. And if that were true of unbaked clay, how many centuries it would require for weathering alone to raze buildings of stone; and then, how many centuries they would lie in their half-ruined state before it would be difficult to distinguish their former dimensions!

Where the Shinumos used adobe as a building material, the reason was not that they did not understand working in stone, but that adobe required less labor and skill in its manipulation, and because, in certain localities, only metamorphic and igneous rocks were to be found, and they possessed no tools with which they could readily dress these, as they could the slabs from sedimentary

outcroppings. Therefore, in igneous regions, or localities where stratified rocks were not easily obtainable, the remains are generally found to consist of adobe, and are, as a rule, mound-shaped. The hardening of the clay around bones or pottery, etc., tended to preserve them, and consequently adobe ruins often yield perfect skeletons and other valuable relics; while amid remains of stone structures only a few frail fragments of pottery and bone are exhumed to repay long and patient labor.

But there may be other reasons why more perfect skeletons are found in one place than in another. Different customs of separate communities must be taken into consideration. Dwellers in easily-constructed adobe houses, upon the death of a member of the family, might have placed the corpse in a position prescribed by the priesthood, with jars of provision for the use of the departed soul on its silent journey to the mysterious land, and barricading the doors and windows, to prevent the entrance of the always-hungry wolf, migrated a short distance and erected a new abode, the old one being left undisturbed. The body, then, in such a dry and sheltered spot, would slowly wither and decay, and before the building crumbled upon it the bones would receive additional protection from the hard, shrivelled remains of the flesh.

But a family would not be so willing to leave a house of stone, that had cost them a vast amount of labor. They would look about them for some more agreeable method of disposing of the corpse. They would select a certain spot for a burying-ground, where they would either dig a grave or arrange the body in some way on the surface. They could not leave it on top of the ground, unless some method was devised for protecting it from the carnivora of the neighborhood. Without such protection, it would soon be scattered over the whole vicinity. Therefore, some curious sarcophagi that I examined in Southern Utah, a mile or two from a valley that contained innumerable remains of *stone* villages, were possibly placed just below the surface, though most of them were covered by several feet of sand, drifted by the winds to the spot. A small creek had cut away a large portion of the bank and exposed a fine section.

In these rude sarcophagi, bodies would not be preserved half so long as those covered by a thick mass of clay, hence I was unable, in the several that I had time to open, to find anything, except at the bottom, a layer of hard, dark earth full of bits of charcoal. This suggested that the body might have been burned in these coffins; or, that after the burial, a large fire was made over the grave, to destroy the scent, or in accordance with some religious ceremony. On the steep slope of sand that extended down to the edge of the creek, among slabs from the graves I found a fragment or two of dark bone, apparently of great age. Several persons from a neighboring settlement assured me that they had seen parts of skeletons and even skulls here. The attendant at a mill close by said that in cutting their canal they had exposed the foot-slabs of two graves, and he offered to shut off the water any day so that I could examine them, but I regret to say that I had no opportunity for a subsequent visit.

The ruins in the valley of the Severir River have generally been found, so far, I believe, to consist of adobe. In digging water ditches, in the town of Monroe, several mounds were cut through, and a number of skeletons unearthed besides some fine specimens of pottery. No one, as far as I could ascertain, knows where the skeletons are now, or the pottery either. There is scarcely a settlement in all Utah that is not on or near the site of an ancient village; and it seems unjust that the few antiquities that are left should be carelessly destroyed. Often, a settler who knows nothing about the Shinumos, and who cares less, finds on his land a mound covered with regular slabs that are just the thing for building a chimney, or a wall, or something of that sort. So he tears the mound to pieces and uses what is desirable. If he runs across a lot of pots, he examines them with some curiosity and sends them into his house. In a few weeks the fragments may be found in the back yard. Should he stumble upon a skeleton, he is at first somewhat amazed; but always considering a *dead* "injun" worthy of unlimited respect, he tenderly gathers the bones together and digs for them a new grave. Occasionally a settlement contains an individual who has gained some knowledge of such things; and if he

happens to be the possessor of any relics he puts upon them no modest price. It is plain that a minute exploration should soon be commenced. There is an opportunity for making a rare collection that would hereafter be of incalculable value to the student of American archæology.

Note.—Since writing the above, I have read a paper in the *American Naturalist* on rock inscriptions.* The writer states that "Throughout this entire country the Navajo Indians and the Utes and Pah-Utes have covered the walls of bowlders with representations of more recent date, in which the horse figures conspicuously," etc. I beg leave to differ with him, at least with regard to the "Pah," or, more properly, Pai-Utes "*covering*" rocks with inscriptions. I have had considerable experience with these Indians; and in all my travels amongst them, and conversations with them, I have found them utterly incapable of expressing an idea or representing anything by means of signs or drawings. They have gathered about and asked me what I was doing, when I sketched. They had not the remotest idea; the whole thing was entirely beyond their comprehension. Indeed, it is almost impossible to conceive the limited range of the Pai-Ute mind in its native state. Writing—"paper-talk"—is a profound mystery to them. I have frequently attempted to explain it to a chief whom I well knew, an Indian of more than ordinary intelligence. I showed him my writing; showed him that the letters were synonymous with those in a newspaper; and that if what I wrote were sent to the "Mericats" in the East, and were printed in that way, they would all understand it. From this he may have obtained a vague idea. I tried to teach him to write the name by which he was called in the settlement, Frank,—pronounced "Brank" by himself and his tribe. After numerous attempts he succeeded in constructing something that had a resemblance to the copy in capitals that I had set for him. I have often given him and other Indians a pen or pencil and paper; but they could not even confine themselves to the lines: they scrawled all over it in

* Rock Inscriptions of the "Ancient Pueblos" of Colorado, Utah, New Mexico and Arizona. Edwin A. Barber.—*Am. Nat.*, *Dec.* 1876.

perfectly objectless scratches. If ever I spoke to them about the hieroglyphs, their invariable answer was "*Mo-keetch;*" they knew no more. Besides, I have seen hundreds of these inscriptions in various parts of the Rocky Mountain region, and I do not remember ever examining a *single* group that was not to a certainty ancient. There may be a very few instances where an Indian who has had much intercourse with whites, in an idle moment scratched a meagre design on some convenient rock; or some white hunter, or trapper, or teamster, may have done the same thing; or the latter may have drawn rude caricatures on rocks close by his camp, with the blackened grease from the wheels of his wagon; but there is no more danger of confounding these things than there is of confounding a dime novel with a volume of standard history.

XII. On the Peopling of America

BY AUG. R. GROTE.

[*Read before this Society, February* 2, 1877.]

THE conclusion was first reached by myself in a paper[1] read before the American Association, August, 1875 (since reprinted in several journals), that we should find colonies of Arctic man upon mountains in the Temperate Zone of North America had all the conditions for his survival on these elevations been fulfilled in his case as they have been in that of certain plants and animals. That the Eskimos are the existing representatives of the man of the American glacial epoch, just as the White Mountain Butterfly (*Oeneis semidea*) is the living representative of a colony of the genus planted on the retiring of the ice from the valley of the White Mountains, seemed to me at that time a natural conclusion. In a subsequent paper,[2] Dr. C. C. Abbott, basing his remarks on paleolithic implements discovered by himself in New Jersey, says: "It is fair to presume that the first human beings that dwelt along the shores of the Delaware were really the same people as the present inhabitants of Arctic America." The title of Dr. Abbott's paper is "Traces of an American Autochthon," and in it he institutes a comparison of the paleolithic implements of New Jersey with those of Southern France. According to a foot-note of Dr. Abbott's it appears that in 1875 Dr. Rink[3] was "strongly of opinion that the Eskimo are an indigenous American people, who have been pushed northwards by the intrusive Indian tribes." A note of mine in objection to the idea that paleolithic man in North America is an "autochthon," will be found in the Am. Nat. for July, 1876, p. 432.

---

[1] Effect of the Glacial Epoch upon the distribution of Insects in North America, Proc. Am. Ass. Adv. Sci., Detroit Meeting, B. Natural History, 225.

[2] Am. Nat., June, 1876, 329.

[3] Tales and Traditions of the Eskimo, London, 1875.

It will be seen that, independently of each other and from different standpoints, the fact that we have in the Eskimo a survival of paleolithic man in North America has been arrived at by Dr. Abbott and, previously, by myself. The subsequent discovery by Prof. Dana[4] of remains of the reindeer in glacial deposits in the Valley of the Connecticut, and the determination of the beds in which the rough stone implements were found as ancient moraines, help to assign a geological age to the presence of man in North America, as well as to give a picture of his surroundings. I have endeavored to carry out the original idea which I entertained, that glacial man would be found to have suffered an equal fate with the fauna of the ice-period, by a study of migrations.

In a lecture delivered in the Course of the Buffalo Society of Natural Sciences[5] Jan. 6, 1877, I published the conclusions arrived at, already briefly sketched in my note in the American Naturalist for July of the preceding year. I proposed to distinguish: "A *primitive* migration, one influenced solely by physical causes affecting man's existence, and which must have been in more extensive operation in early times when he was unprovided with means of his own invention against unfriendly changes in his surroundings. Such migrations, or a modified survival of them, are operative now among our Indians, who move from place to place with the game upon which they subsist and with the season. A *culture* migration, one arising out of a certain stage of intellectual advancement when the movements of man are determined by ultimate and not immediate considerations. The movements of the Indo-European races fall within this category. Besides these is to be distinguished an *accidental* migration, which man has submitted to against his will. The accidental migrations of man may be considered as belonging to the epochs of culture migration, since they must more usually have occurred with races advanced in the art of navigation. A separation of individuals from communities under the pressure of storms, earthquakes, volcanic eruptions, etc., may have happened, however, in the earliest times."

It will be seen that I differ from Dr. Abbott by considering the presence of the progenitors of the Eskimo over the main belt of

[4] Am. Jour. Sci. Arts, 353, Nov. 1875.

[5] Buffalo Courier, Jan. 7, 1877.

this continent during the Ice-period, as due to "a primitive and unconscious migration determined by the shifting of their congenial surroundings." It does not appear that Dr. Rink couples the migration of the Eskimo with the movement of the ice over this continent. Indeed, his idea seems opposed to this and does not imply any relation between the Eskimo and the Ice-period.

These discoveries and considerations open up the question of tertiary man. It is certain, as I have elsewhere suggested, that man could not have originated at the foot of the glacier. The ice must have met him, towards the close of the Tertiary, in the northern parts of Asia and America and forced him southward; or, at a later time, it must have found him on the main belt of this continent. The tertiary origin of man is presupposed from the fact that he had submitted to a race-modification fitting him to endure the cold. Some support for these ideas may be found in examining northern strata; it must be borne in mind, however, that the north has never been free from ice since the close of the Pliocene to this day.

It would appear more sensible, in view of the present ascertained facts of science, that, for the original Tertiary form of man, we should search a territory inhabited at that time by animals the nearest related to him. Considerations of this kind will prevent us from entertaining the belief that man originated in America. We must still believe that America has always been for man the New World.

If we turn to the detached Antarctic lands, covered by glaciers descending to form an ice-wall along their coasts, to be fretted away by the beating of the ocean waves, we see that other sciences may be advanced by their exploration, but Anthropology only indirectly. In February, 1842, Ross reached the most southern point yet attained, lat. 78° 11′, long. 161° 27′ W., and it is strange that both he and Weddell[6] report an open sea before them to the south, as Kane did to the north.

So soon as Arctic America is explored by means of the establishment of permanent stations of observation, akin to that in operation on Mount Washington, a system recently recommended in this country as well as in Europe, important data as to the intro-

[6] Neumayer. Zeits. Ges. Erdk., 1872.

duction of man on this continent cannot fail to be brought to light. The establishment of an International Scientific Service for the observation of astronomical, meteorological, geological and zoological phenomena commends itself at the present time to the more civilized Powers. The different governments established by the white races should contribute their quota of the expenses for the establishment and maintenance of posts of observation in different localities over the globe, to be decided upon by commissions of specialists. In time of war such posts should be held neutral, as well as their service, under a flag and protected by the operation of international law. In the case of the Arctic regions, Great Britain, the United States, Russia and Scandinavia are the more interested from their geographical position ; yet other Powers are directly interested in the solution of the different problems which will be offered through the knowledge of those parts of the Earth's surface. In Madagascar we must also expect some evidence to be forthcoming with reference to the origin of man. A definite settlement of the latter question can be arrived at if Evolution be true. Is not this a question to call for the active interest of the cultivated races? Its settlement would greatly advance our material interests as a species by giving us a mental habit in accordance with the facts in the case. I think that the prospect alone of arriving at a solution of this question should prompt concerted action, either by a Scientific Service or such other means as experience may prefer.

When we examine into the question of the stone implements which prove the fact of the presence of man, we must see that the earlier man must have first used a stone as he found it. "There must have been a time when men picked up such stones as came in their way at the moment with which to throw at animals, to break their food, to injure their fellow men. Such stones, unaltered by use, can no longer be identified." There will be an imperfection here in the record from implements.

The difficulty of supposing man to have been introduced into America during the Quarternary lies in the fact that he must have been in the stone age when the migration was made. This difficulty vanishes if, as I suppose, man entered upon possession of this continent during the Pliocene, and before the Ice-period had interfered with a warm climate in the north. This will leave us free to

consider American civilizations indigenous. The idea is here suggested that the Ice-period acted as a barrier to inter-communication between Asia and North America. The part allowed hitherto by anthropologists to accidental migration in the peopling of North America will be found, I think, exaggerated. We may conceive that this peopling was effected during the Tertiary; that the ice modified races of Pliocene man, existing in the north of Asia and America, forced them southward, and then drew them back to the locality where they had undergone their original modification. Also we may suggest that other than Arctic man may have existed across the main belt of this continent during the Pliocene, and that his subsequent intellectual development, as we find it recorded in the West, Mexico, and South America, etc., is the result of his environment acting upon his isolated condition.

The object of the present paper is to call attention to this hypothesis which must be studied from the point of view that man's earlier migrations were not distinguishable in kind from those of lower animals. It seems to me quite evident that, at a time when instinct was developing into reason, the migrations of man must have had a motive which was not far removed from that influencing certain lower animals under the same circumstances. If we concede this, it follows that the objects of man's primitive migrations were more immediate, and of his culture migrations more remote. This one fact, that the distribution of man over the surface of the globe is more general than that of any other animal, will support the view that, through the fertility of his resources, he has been able to outgrow the limitations originally imposed upon him. But these resources must have been brought into play by experience; and their cost was surely the premature perishment of many of the kind.[7] During the process, then, which resulted in the race modification of the Eskimos, their original numbers must have been decreased by the slowly but ever increasing cold of the northern regions, until experience and physical adaptation combined brought them to a state of comparative stability as a race.

[7] Many birds suffer the death of their companions by the hunter with indifference when first discovered by man, but afterwards, from observation, avail themselves of all their natural means to escape from the danger. It is possible that it was not difficult for Tertiary man to supply himself with animal food even with his imperfect weapons.

We must also consider that the farther back we go the nearer we must come to a common race of man, supposing the theory of the essential unity of his origin to be true, while I think the probable effect of the Ice-period upon climate and the present development of man, has not been hitherto sufficiently considered. The entire environment must be taken into consideration, however complex it is and at whatsoever cost to us the knowledge of it is to be attained, before we can grasp the true picture of the succession of events which have resulted in man as we now find him on the different lands of the globe. With the thinking minds of our race, the question of the origin of man is the question of the century.

XIII. On Certain Species of Black-winged Catocala

BY AUG. R. GROTE.

[*Read before this Society, Feb.* 2, 1877.]

I HAVE recently[1] arranged the different North American forms with black secondaries, belonging to the genus *Catocala*, into two sub-groups, characterized by the fringes to the hindwings being dusky and blackish, or white. There is a great similarity between several of the black-winged species in either group. In the group with white fringes we have *C. desperata*, *C. retecta* and *C. flebilis*, as an example of very nearly allied forms. In the black-fringed group we have *C. insolabilis*, *C. residua* and *C. Angusi*, exhibiting a parallel relationship. I have attempted a photographic representation on the accompanying Plate V of these three latter species, of which specimens of both sexes are contained in the collection of this Society.

C. insolabilis[2] differs from the two allied species in the blue-gray tint of the thorax and forewings, especially of the median space. The internal margin is more or less suffused with blackish before the transverse anterior, and behind the transverse posterior line. Here the scales are slightly metallic as in *C. innubens*. At apices the fringe is usually flecked with white. The reniform is reduced in size. Beneath, the white median band is more obsolete or narrower and deeply tinged with bluish. The body parts are more white below, and we are a little reminded of *C. epione*.

C. residua[3] is characterized by the peculiar dusky or smoky tinge of the primaries, from the base to the gray subterminal shade; the thorax being of the same hue. A similar smoky color is shown by *C. obscura*, and *C. simulatilis*, which belong to the white-fringed sub-group, and *C. serena*, which belongs to the yellow-winged group. There is a black shade opposite the cell beyond and edging

[1] Can. Ent. 8, 230, Dec. 1876.

[2] Guen. Sp. Gen. 7, 94.

[3] Grote, Proc. Bost. Soc. N. Hist. xvi, 212.

the subterminal line. The distinct transverse lines run a little more straightly and parallel at internal margin below the internal vein. The costal tooth of the transverse posterior line is a little shorter than in its allies.

C. Angusi[4] may be distinguished by its greenish-gray tint on fore-wings and thorax. It is a little less roughly scaled, and more silky than *C. insolabilis*. It varies in sometimes showing a strong black basal shade, another from reniform to external margin, and another beyond the transverse posterior line at its last sinus, while in one male specimen these are all wanting except the last, which is feebly indicated. The reniform is large, as in *C. residua*, which latter species it more nearly resembles on the under surface of the wings.

On the accompanying Plate, figures 1 and 2 represent the male and female of *C. Angusi;* figure 3 represents *C. insolabilis;* figure 4, *C. residua.*

[4] Can. Ent. 8, 229, Dec. 1876.

XIV. The Hyphomycetous Fungi of the United States

BY M. C. COOKE, M. A.

[*Read before this Society, Feb.* 2, 1877.]

THIS division of the Fungi of the United States is in the most unsatisfactory condition, requiring complete examination and verification. The present list must therefore be regarded as involving no responsibility for accurate determination, but as a preliminary step towards securing verification:

Order I. ISARIACEI.

1. **Isaria farinosa** *Fr.* S. M. iii, 270. On dead *pupae*. Car. (Curt.); N. Eng. (Murray).
   [**Stilbum ramosum** *Peck*, probably belongs to this species.]
2. **Isaria sphingum** *Schw.* (syn. Car. 1298), Am. Bor. 3055. On *Phalaena*. Car. (Curt.).
3. **Isaria aranearum** *Schw.*, Am. Bor. 3057. On spiders. Car. (Curt.).
4. **Isaria nigripes** *Schw.*, Am. Bor. 3068. On chrysalids. Car. (Curt.).
5. **Isaria phalangiophila** *Schw.* (syn. Car. 1299), Am. Bor. 3056. Car. (Schw.).
6. **Isaria crassa** *Schw.*, Am. Bor. 3054. On chrysalids. Penns. (Schw.).
7. **Isaria furcata** *Schw.* Am. Bor. 3067. On chrysalids. Bethlehem (Schw.).
   All the foregoing are conidia of species of *Torrubia*, although entered here.
8. **Isaria brachiata** *Schum.* Curt. Cat. p. 125. On *Agarics*. Car. (Curt.).
9. **Isaria agaricina** *Pers.* Schw., Am. Bor. 3058. On *Agarics*. Bethlehem (Schw.).
   [Perhaps the same as the preceding].
10. **Isaria radiata** *B. & C.*, Grevillea iv, 584. On pine wood. Ala. (Peters).
11. **Isaria brevis** *B. & C.*, Grevillea iv, 585. On decayed wood. Penns. (Mich.).
12. **Isaria congesta** *B. & C.*, Grevillea iv, 586. On *Sphaeria deusta*. Car. (Curt.).
13. **Isaria umbrina** *Schw.*, Am. Bor. 3064. On rotten wood. Car. (Curt.).
    [The conidia of *Hypoxylon coccineum*.]
14. **Isaria citrina** *Pers.* Schw., Am. Bor. 3066. On rotten trunks. Car. (Schw.; Curt.).

15. **Isaria carnea** *P.* Schw., Am. Bor. 3069. On stems and leaves. Car. (Curt.).
16. **Isaria clavata** *Ditm.* Schw., Am. Bor. 3060. On rotten chips.
17. **Isaria bulbosa** *Nees.* Schw., Am. Bor. 3061.
18. **Isaria hydnoides** *Lk.* Schw., Am. Bor. 3062. On trunks.
19. **Isaria glaucocephala** *Lk.* Schw., Am. Bor. 3063. On branches.
20. **Isaria furcellata** *Mart.* Schw., Am. Bor. 3065. On rotten chips.
21. **Isaria candida** *Schw.*, Am. Bor. 3070. On rotten wood.
22. **Isaria globosa** *Schw.*, Am. Bor. 3071. On the ground.
23. **Isaria bicolor** *Schw.*, Am. Bor. 3072. On stems lying on the ground.

Some of these species are entered solely on the authority of Schweinitz, and require verification.

24. **Ceratium hydnoides** *A. & S.* Schw., Am. Bor. 3074. On dead wood. Car. (Curt.); Ala. (Peters); N. Y. (Peck).
25. **Ceratium porioides** *A. & S.* Schw., Am. Bor. 3076. On pine wood. Car. (Schw.; Curt.); N. Y. (Peck).
26. **Ceratium pyxidatum** *Schw.*, Am. Bor. 3075, is probably the same as the last.
27. **Ceratium crustaceum** *B. & C.*, Grevillea iv, 587. On decayed wood. New Jersey (B.).
28. **Ceratium insociabile** *Gerard.* Bull. Torr. Club. On leaves.
29. **Dacrina cinnabarinum** *Nees.* Schw., Am. Bor. 3078. On bark of *Juglans.* Car. (Curt.).
30. **Dacrina hydnoideum** *Schw.*, Am. Bor. 3079. On *Rhododendron* wood.
31. **Gliotrichum fuligo** *Fr.* (*Dematium fuligo* Schw., Am. Bor.).
32. **Peribotryon coccineum** *Fr.* (*Coremium coccineum* Schw., Am. Bor.).
33. **Peribotryon subiculatum** *Fr.* (*Coremium subiculatum* Schw., Am. Bor.).
34. **Peribotryon camptotrichum** *Fr.* (*Camtotrichum splendidum* Schw.).

Order II. **STILBACEI.**

35. **Stilbum tomentosum** *Schr.* Schw., Am. Bor. 3715. On *Arcyria* and *Trichia.* Car. (Schw.; Rav.); N. Y. (Peck).
36. **Stilbum fimetarium** *B.*, Grevillea iv, p. 63. On dung. Car. (Curt.).
37. **Stilbum byssinum** *P.* Schw., Am. Bor. 2716. On putrid fungi. Car. (Schw.; Curt.).
38. **Stilbum bulbosum** *Tode.* Schw., Am. Bor. 2718. On stems. Car. (Schw.; Curt.).
39. **Stilbum piliforme** *A. & S.* Schw., Am. Bor. 2717. On wood. Car. (Schw.; Curt.).
40. **Stilbum lateritium** *Berk.* Lond. Jour., 1843, 642. On bark. Car. (Curt.).
41. **Stilbum cinereo-rubrum** *B. & C.* On *Cyrilla* and *Hibiscus.* Car. (Curt.).

42. **Stilbum carcinophthalmum** *B. & C.*, Grevilea iv, 590. On dead stem of parsnip. Car. (Curt.).
43. **Stilbum leucocephalum** *B. & C.*, Grevillea iv, 596. On bark of *Carya*. Car. (Curt.).
44. **Stilbum aurifilum** *Gerard*, Bull. Torr. Club. On old *Daedalea*.
45. **Stilbum giganteum** *Peck.*, 24th Report, p. 93. On old logs. N. Y. (Peck).
46. **Stilbum pellucidum** *Schrad.* (*fide* Peck). On rotten wood. N. Y. (Peck).
47. **Stilbum rhoidis** *B. & C.*, Grevillea iv, 595. (*Sporocybe Rhois* Curt.). On bark of *Rhus*. Car. (Curt.); N. Y. (Peck).
48. **Stilbum vulgare** *Tode*. Schw., Am. Bor. 3713. On dead wood. Maine (Sprague); Car. (Curt.); N. Eng. (Frost).
49. **Stilbum gelatinosum** *P.* Schw., Am. Bor. 2714. On trunks. Car. (Schw.; Curt.).
50. **Stilbum rigidum** *P.* Schw., Am. Bor. 2719. On dead twigs of *Carya*. Car. (Curt.).
51. **Stilbum turbinatum** *Tode*. Schw., Am. Bor. 2720. On wood. Car. (Schw.; Curt.).
52. **Stilbum rubicundum** *Tode*. Schw., Am. Bor. 2721. On beech stumps. Car. (Schw.; Curt.).
53. **Stilbum spragnei** *B. & C.*, Grevillea iv, 589. On cabbage stalks. N. Eng. (Sprague).
54. **Stilbum annulatum** *B. & C.*, Grevillea iv, p. 63. On cabbage stalks. Car. (Curt.).
55. **Stilbum lichenoideum** *B. & C.*, Grevillea iv, 592. On dead wood of *Juniperus*. Penns. (Mich.).
56. **Stilbum vellereum** *B. & C.*, Grevillea iv, 593. On decayed wood. Penns. (Mich.).
57. **Stilbum aleuriatum** *B. & C.*, Grevillea iv, 594. On decayed wood of *Acer*. Texas (Wright).
58. **Stilbum roseum** *Schw.*, Am. Bor. 2722. On rotten wood.
59. **Stilbum inquinans** *Schw.*, Am. Bor. 2723. On branches.
59½. **Chordostylum capillare** *Fr.* Schw., Am. Bor. 2712. On leaves.
60. **Atractium fusisporum** *B. & C.*, in Curt. Cat. 126. On bark of *Acer*. Car. (Curt.).

This and *Atractium flammeum* are doubtless forms of *Sphaerostilbe*.

61. **Hyalopus mucorinus** *B. & C.*, Grevillea iv, 598. On hens' dung. Car. (Curt.).
62. **Hyalopus parasitaus** *B. & C.*, Grevillea iv, 597. On decayed *Merulius*. Car. (Curt.).
63. **Hyalopus griseus** *B. & C.*, Grevillea iv, 599. On wood, under the bark of *Nyssa*. Car. (Curt.).

64. **Graphium explicatum** *B. & C.*, Grev. iv, 620. On twigs of *Quercus Catesbei* and *nigra*. Car. (Curt.).

65. **Graphium clavisporum** *B. & C.*, Grevillea iv, 619. On vine leaves. Car. (Curt.).

66. **Chondromyces crocatus** *B. & C.*, Grev. iv. 600. On decayed melons. Car. (Curt.).

67. **Tuberculariа vulgaris** *Lk.* Schw., Am. Bor. 2999. On branches. (Conidia of *Nectria*, as also are the majority of species in this genus.) Car. (Schw.; Curt.); N. Y. (Peck); Ohio (Lea.); Maine (E. C. B.).

68. **Tuberculariа granulata** *Schw.*, Am. Bor. 3003. On branches. Car. (Schw.; Curt.); N. Eng. (Frost).

69. **Tuberculariа minor** *Schw.*, Am. Bor. 3006. On *Castanea*. Car. (Schw.; Curt.).

70. **Tuberculariа nigricans** *Schw.*, Am. Bor. 3006. On wood and bark of *Fraxinus*. Car. (Curt.); N. Eng. (Frost); N. Y. (Peck).

71. **Tuberculariа microsperma** *B. & C.* Curt. Cat., p. 126. On pine cones. Car. (Curt.).

72. **Tuberculariа dubia** *Schw.*, Am. Bor. 3004. On branches. Car. (Curt.).

73. **Tuberculariа persicina** *Ditm.* Curt. Cat., p. 126. On *Uredo luminata*. Car. (Curt.).

74. **Tuberculariа pezizoidea** *Schw.*, Am. Bor. 3013. On poplar. N. Y. (Schw.); N. Eng. (Sprague).

The following require revision:

75. **Tuberculariа subdiaphana** *Schw.*, Am. Bor. 3020. On *Vitis*.

76. **Tuberculariа calycanthi** *Schw.*, Am. Bor. 3019. On branches of *Calycanthus*.

77. **Tuberculariа fatescens** *Schw.*, Am. Bor. 3018. On branches.

78. **Tuberculariа radicalis** *Schw.*, Am. Bor. 3017. On roots of trees.

79. **Tuberculariа difformis** *Schw.*, Am. Bor. 3016. On spines of *Crataegus*.

80. **Tuberculariа celastri** *Schw.*, Am. Bor. 3015. On branches of *Celastrus*.

81. **Tuberculariа subpedicellata** *Schw.*, Am. Bor. 3014. On branches of *Lycium*.

82. **Tuberculariа pusilla** *Fr.* Schw., Am. Bor. 3012. On young branches.

83. **Tuberculariа sarmentorum** *Lk.* Schw., Am. Bor. 3011. On *Zea*.

84. **Tuberculariа menispermi** *Schw.*, Am. Bor. 3010. On branches of *Menispermum*.

85. **Tuberculariа herbarum** *Schw.*, Am. Bor. 3009. On stems of *Artemisia*.

86. **Tuberculariа liceoides** *Schw.*, Am. Bor. 3008. On cabbage stalks.

87. **Tuberculariа ciliata** *Schw.*, Am. Bor. 3007. On rotten wood.

88. **Tuberculariа floccosa** *Schw.*, Am. Bor. 3005. On *Rhus typhina*.

89. **Tuberculariа mirabilis** *Schw.*, Am. Bor. 3002. On branches of *Morus*.

90. **Tuberculariа lutescens** *Schw.*, Am. Bor. 3000. On branches of *Aralia*.

91. **Cheiromyces stillatus** *B. & C.*, Grevillea iv, 601. On *Scirpus Eriophorum.* Penns. (Mich.) ; Ala. (Beaum.).
92. **Stigmatella aurantiaca** *B. & C.*, Grevillea iv, 602. On *Sphaeria Hibisci* and lichens. Car. (Curt.: Rav.).
93. **Volutella ciliata** *Fr.* Schw., Am. Bor. 3023. On stems. Car. (Curt.).
94. **Volutella pulchra** *B. & C.*, Grevillea iv, 603. On willow branches. Conn. (B.).
95. **Fusarium roseum** *Lk.* Schw., Am. Bor. 3022. On various substances. Car. (Curt.); N. Y. (Peck).
96. **Fusarium lateritium** *Schw.*, Am. Bor. 3026. On various plants. Car. (Curt.; Rav.); Ohio (Lea); N. Y. (Peck).
97. **Fusarium aurantiacum** *Cda.* On *Acacia julibrissin* and gourds. Car. (Curt.).
98. **Fusarium marginatum** *B. & C.*, Grevillea iv, 604. On stems of *Smilax.* Ala. (Peters).
99. **Fusarium microspermum** *B. & C.*, Grevillea iv, 605. On fig. Santee River (Rav.).
100. **Fusarium helotioides** *B. & C.*, Grevillea iv, 606. On *Ilex prinoides.* Ala. (Peters).
101. **Fusarium Mikaniae** *B. & C.*, Grevillea iv, 607. On stems, etc., of *mikania.* Santee River (Rav.; Curt.).
102. **Fusarium nitidum** *B. & C.*, Grevillea iv, 608. On *Aralia spinosa.* Penns. (Mich.).
103. **Fusarium erubescens** *B. & C.*, Grevillea iv, 609. On dead bark. Ala. (Beaumont); N. Y. (Peck).
104. **Fusarium semitectum** *B. & Rav.* Grevillea iv, 610. On petioles of banana. Penns. (Rav.).
105. **Fusarium cymbiferum** *B. & C.*, Grevillea iv, 611. On herbaceous stems. Car. (Curt.).
106. **Fusarium anomalum** *B. & C.*, Grevillea iv, 612. On *Gleditschia.* N. Eng. (Sprague).
107. **Fusarium Berkelei** *Mont.* Grev. iv, 612.* On fig. *Hibiscus, cornus.* Car. (Curt.; Rav.). Ala. (Peters).
108. **Fusarium stictieum** *B. & C.*, Grev. iv, 613. On peach twigs. Car. (Curt.).
109. **Fusarium arcuatum** *B. & C.*, Grev. iv, 614. On apple bark. Car. (Curt.).
110. **Fusarium pyrinum** *Schw.*, Am. Bor. 3028. On apple. Penns. (Schw.).
111. **Fusarium pallens** *Lk.* Schw., Am. Bor. 3021. On bark. N. Y. (Schw.).
112. **Fusarium Curtisii** (*Fusarium pallens* B. & C., in Grevillea iv, 615. Not Link). On inflorescence of *Juncus.* Car. (Curt.).
113. **Fusarium heterosporium** *Lk.* Schw., Am. Bor. 3027. On *Paspalum.* Penns. (Schw.).

114. **Fusarium oxysporum** *Schlecht.* Schw., Am. Bor. 3025. On legumes of *Phaseolus.*

115. **Fusarium stilbaster** *Lk.* Schw., Am. Bor. 3024. On roots.

116. **Fusarium effusum** *Schw.*, Am. Bor. 3029. On branches of *Hypericum.*

117. **Fusarium coccineum** *Schw.*, Am. Bor. 3031. On bark of *Castanea.*

118. **Fusarium capitatum** *Schw.*, Am. Bor. 3032. On wood of *Pinus Canadensis.*

119. **Fusarium inseptatum** *Schw.*, Am. Bor. 3030. On bark of *Mezereum.*

120. **Myrothecium convexum** *B. & C.*, Grevillea iv, 616. On decaying grapes. Penns. (Mich.).

121. **Myrothecium roridum** *Tode.* Grev. iv, 616* (*M. carmichaeli* Schw., Am. Bor. 2389). On leaves, etc., of *Syringa.* Car. (Curt.); N. Eng. (Murray).

122. **Myrothecium inundatum** *Tode.* Schw., Am. Bor. 2388 (*M. fungicola.* Peck). On Agarics. N. Y. (Peck).

123. **Myrothecium verrucaria** *Ditm.*, Schw., Am. Bor. 2390. On leaves, grass, etc. Car. (Curt.). Ala. (Beaumont); Penns. (Mich.).

124. **Dermosporium atrum** *Schw.*, Am. Bor. 3035. On hickory wood.

125. **Dermosporium roseum** *Schw.*, Am. Bor. 3034. On rotten wood.

126. **Dermosporium decolorans** *Schw.*, Am. Bor. 3033. On stems of plants.

127. **Myxormia atroviridis** *B. & Br.* Grevillea iv. On bark of *Rubus.* Ala. (Beaumont).

128. **Epicoccum scabrum** *Corda.* Icon. i, fig. 81. On dry roots of *Nyssa.* Car. (Curt.).

129. **Epicoccum neglectum** *Desm.* Cooke, Hdbk., No. 1678. On male inflorescence of *Zea.* Car. (Curt.).

130. **Epicoccum micropus** *Corda.* Icon. iii, 82. On old pods of *Phaseolus.* Penns. (Mich.).

131. **Epicoccum simplex** *B. & C.*, Grev. iv, 617. (*E. sphoerospermum* Curt.). On leaves of *arundinaria.* Car. (Curt.).

132. **Epicoccum nigrum** *Schw.*, Am. Bor. 3037. On stems of *Ricinus.*

133. **Epicoccum purpurascens** *Schw.*, Am. Bor. 3038. On stems of asparagus.

134. **Epicoccum caricicola** *Schw.*, Am. Bor. 3039. On leaves of *Carices.*

135. **Sphaerosporium lignatile** *Schw.*, Am. Bor. 3036. On bark of oak and willow.

136. **Illosporium coccineum** *Fr.* Schw., Am. Bor. 2406. On lichens. Car. (Curt.).

137. **Illosporium roseum** *Fr.* Cooke, Hdbk., No. 1680. On *Physcia.* N. Y. (Peck).

138. **Illosporium carneum** *Fr.* Cooke, Hdbk., No. 1681. On *Peltigera.* N. Y. (Peck).

139. **Illosporium persicinum** *Fr.* Curt. Cat., p. 126. On pine palings. Car. (Curt.).

140. **Illosporium caesium** *Schw.*, Am. Bor. 2407. On wood of walnut.
141. **Aegerita candida** *E.* Schw., Am. Bor. 3040. On decayed bulb. Car. (Curt.).
142. **Aegerita ovula** *Schw.*, Am. Bor. 3043. On very rotten wood. Car. (Curt.).
143. **Aegerita lutescens** *Schw.*, Am. Bor. 3042. On wood.
144. **Aegerita caesia** *Schw.* Am. Bor. 3041. Syn. Car. 1275. On wood. Car. (Schw. Curt.).

Order III. **DEMATIEI.**

145. **Pachnocybe rosea** *B. & C.*, Grevillea iv, 588. On bark of *Robinia*. Car. (Curt.).
146. **Pachnocybe subulata** *B.* (*Periconia*, Schw., Am. Bor. 3045.) On wood of Acacia. Car. (Curt.); Penns. (Schw.); N. Eng. (Sprague).
147. **Periconia gracilis** *Schw.*, Am. Bor. 3047. On capsules of *Staphylea*.
148. **Periconia Azaleae** *Peck.* 25th Report, p. 93. On capsules of *Azalea*. N. Y. (Peck).
149. **Periconia epiphylla** *Schw.*, Am. Bor. 3047. On leaves.
150. **Periconia nana** *Lk.* Schw., Am. Bor. 3046. On pine leaves.

We have two or three other forms of *Periconia*, but the specimens are insufficient for accurate description.

151. **Sporocybe byssoides** *Fr.* (Periconia, Schw., Am. Bor. 3044.) On dead herbaceous stems, etc. Car. (Curt.). Penns. (Schw.); New York (Peck).
152. **Sporocybe Persicae** *Fr.* Curt. Cat., p. 126. On bark of Persica and Cerasus. Car. (Curt.). N. Y. (Peck).
153. **Sporocybe calicioides** *Fr.* Grev. iv, No. 618. On bark of poplar. Car. (Rav.). Maine (Rev. J. Blake); N. E. (Sprague).
154. **Sporocybe fasciculata** (*Periconia*, Schw., Am. Bor. 3049). Curt. Cat., p. 126. On stems. Car. (Curt.).
155. **Sporocybe bulbosa** (*Periconia*, Schw., Am. Bor. 3051). Curt. Cat., p. 126. On stems. Car. (Curt.).
156. **Sporocybe macularis** (*Periconia*, Schw., Am. Bor. 3050). Curt. Cat., p. 127. On naked wood. Car. (Curt.).
157. **Sporocybe alternata** *B.* in Grev. iv, No. 618. On damp paper. Car. (Curt.).
158. **Stachybotrys atra** *Corda.* Icon. i, fig. 278. On damp paper. Car. (Curt.).
159. **Cephalotrichum rigescens** *Lk.* Schw., Am. Bor. 3052. On wood. N. E. (Russell).
160. **Cephalotrichum monilioides** *Lk.* Schw., Am. Bor. 3053. On trunks of *Pinus Canadensis*.

161. **Dendryphium fasiculare** *B. & Rav.* Grev. iv, 618. On bark of *Liquidambar.* Car. (Rav.).

162. **Monotospora setosa** *B. & C.*, Grev. iv, 621. On decayed wood in moist places. Car. (Curt.).

163. **Monotospora triseptata** *Peck.* 24th Report, p. 94, is *Helminthosporium apicale* B. & Br.

164. **Oedemium atrum** *Fr.* Schw., Am. Bor. 2610. On leaves and twigs. Car. (Curt.).

165. **Oedemium sparsum** *B. & Rav.* Grev. iv, 622. On bark of *Platanus.* Car. (Rav.).

166. **Actinocladium penicillus** *Fr.* Curt. Cat., p. 127. On leaves of sassafras. Car. (Curt.).

167. **Glenospora Curtisii** *B. & Desm.* Journ. Hort. Soc. Lond. On branches of *Nyssa*, *Quercus*, etc. Car. (Curt.).

168. **Glenospora Melioloides** Curt. Cat., p. 127. On living leaves of *Galax.* Car. (Curt.).

169. **Helminthosporium tiara** *B. & Rav.* Grev. iv, 640. On fallen branches. Car. (Rav.).

170. **Helminthosporium princeps** *B. & C.*, Curt. Cat. 127. On living bark of *Quercus.* Car. (Curt.).

171. **Helminthosporium macrocarpum** *Grev.* Sc. Cr. Fl. t. 148. On branches. Car. (Curt.).

var. caudatum *B.* in Grevillea (*Helminthosporium caudatum* Curt.). On *Castanea* and oak. Car. (Grav.; Curt.).

172. **Helminthosporium corticale** *Schw.* Am. Bor. 2627. On bark of *Platanus.* Car. (Curt.).

173. **Helminthosporium apicale** *B. & Br.* (*Monotospora triseptata* Peck). Cooke, Hdbk., No. 1723. On rotten wood. N. Y. (Peck).

174. **Helminthosporium obtusissimum** *B. & C.*, Grev. iv, 632. On dead wood. Car. (Curt.).

175. **Helminthosporium attennatum** *C. & P.* (*clasterisporium* Peck). On cut surface of wood. N. Y. (Peck).

176. **Helminthosporium arbuscula** *B. & C.*, Grev. iv, 630. On bark of various trees. Car. (Curt. Rav.).

177. **Helminthosporium melanosporum** *B. & C.*, Grev. iii, 636. On fallen branches. Car. (Curt.). N. Eng. (Sprague).

178. **Helminthosporium siliquosum** *B. & C.*, Grev. iv, 624. On branches of *Vitis* and *Smilax.* Car. (Curt.).

179. **Helminthosporium apiculatum** *Corda.* (Helm. *lanceolatum* Curt.). Cooke, Hdbk., No. 1722. On *Cornus* and oak. Car. (Curt.).

180. **Helminthosporium fragilissimum** *B. & C.*, Grev. iv, 627. On dead twigs of *Smilax.* Car. (Curt.).

181. **Helminthosporium rectum** *B. & C.*, Grev. iv, 631. On oak wood. Car. (Curt.).

182. **Helminthosporium molle** *B. & C.*, Grev. iv, 633. On *Passiflora* and *Dolichos*. (Car. (Curt.).

183. **Helminthosporium Ravenelii** *Curt.* Grev. iv, 628. (*Helminthosporium Hoffmanni* Berk. MSS.) On inflorescence of *Sporobolus*. Car. (Curt.; Rav.).

184. **Helminthosporium nodosum** *B. & C.*, Grev. iv, 629. On inflorescence of *Eleusine Indica*. Car. (Curt.).

185. **Helminthosporium Petersii** *B. & C.*, Grev. iv, 626. On leaves of *Smilax*, etc. Car. (Curt.). Ala. (Peters).

186. **Helminthosporium interseminatum** *B. & Rav.* Grevillea iv, 634. On *Phytolacca* and *Cicuta*. Car. (Rav.). Penns. (Mich.).

187. **Helminthosporium Pruni** *B. & C.*, Grev. iv, 635. On bark of *Prunus serotina*. Car. (Curt.).

188. **Helminthosporium dubium** *Schw.*, Am. Bor. 2626. On branches.

189. **Helminthosporium Berkeleyi** (*Helminthosporium dubium* B. & C., not Schw. in Grev. iv, 637). On leaves of *Viburnum* (?). Ala. (Beaum.).

190. **Helminthosporium inflatum** *B. & Rav.* Grev. iv, 638. On branches of *Myrica*. Car. (Rav.).

191. **Helminthosporium subfuscum** *B. & C.*, Grev. iv, 639. On dead branches. N. J. (M. J. B.).

192. **Helminthosporium olivaceum** *B. & R.*, Grev. iv, 625. On leaves of *Gleditschia*. Car. (Rav.). Penns. (Schw.).

193. **Helminthosporium foliculatum** *Corda*. Grev. iv. Cooke, Hdbk., No. 1707. On bark, stems, etc. Car. (Curt.). Penns. (Mich.); N. Eng. (Murray).

194. **Helminthosporium velutinum** *Lk.* Schw., Am. Bor. 2618. On dead twigs. Car. (Rav.). Penns. (Schw.).

195. **Helminthosporium clavariarum** *Desm.* Cooke, Hdbk., No. 1720. On *Clavaria*. N. Eng. (Sprague).

196. **Helminthosporium simplex** *N.* Schw., Am. Bor. 2623. On willow wood.

197. **Helminthosporium nanum** *Lk.* Schw., Am. Bor. 2621. On rotten wood.

198. **Helminthosporium subulatum** *Lk.* Schw., Am. Bor. 2619. On branches.

199. **Helminthosporium corniculatum** *Schw.*, Am. Bor. 2633. On oak bark.

200. **Helminthosporium brassicola** *Schw.*, Am. Bor. 2632. On cabbage leaves.

201. **Helminthosporium Sorghi** *Schw.*, Am. Bor. 2631. On leaves of *sorghum*.

202. **Helminthosporium herbarum** *Schw.*, Am. Bor. 2630. On stems of *Euphorbia*.

203. **Helminthosporium crustosum** *Schw.*, Am. Bor. 2629. On young branches of *Catalpa*.

204. **Helminthosporium virgultorum** *Schw.*, Am. Bor. 2628. On branches of *Morus*.

205. **Helminthosporium fasciculatum** *Schw.*, Am. Bor. 2625. On leaves.

206. **Helminthosporium tenuissimum** *Lk.* Schw., Am. Bor. 2624. On stems of plants.

207. **Helminthosporium pellucidum** *Lk.* Schw., Am. Bor. 2622. On branches.

208. **Helminthosporium minus** *Lk.* Schw., Am. Bor. 2620. On branches.

208 *a*. **Septosporium velutinum** *C. & Ellis* in Grevillea v, p. 33. On maple wood. New Jersey (Ellis).

209. **Fusicladium dendriticum** *Vckl.*, Syn. Myc. (*Cladosporium dendriticum* Walls). On apples and apple leaves. Car. (Curt.). Canada (Poe).

210. **Fusicladium pyrorum** *Vckl.* (*Fusidium pyrinum* Mart.) (*Helminthosporium pyrorum* Desm.). On pear leaves. Car. (Rav. Curt.).

211. **Podosporium rigidum** *Schw.*, Am. Bor. 2608. On bark of various trees. Car. (Curt. Rav.).

212. **Podosporium briareus** *B. & C.*, Grev. iv, 623. On dead branches. Car. (Curt.).

213. **Podosporium praelongum** *Curt.* Cat., p. 127. On branches of *Vaccinium*. Car. (Curt.).

214. **Podosporium glandicola** *Schw.*, Am. Bor. 2609. On acorns and cups.

215. **Clasterisporium caricinum** *Schw.*, Am. Bor. 2998. On leaves of *Carex*. N. Y. (Peck).

[*Clasterisporium pedunculatum* Peck, 25th Report is *Helminthosporium attenuatum* C. & P.]

216. **Mystrosporium Curtisii** *B.*, in Grevillea iv, 644. (*Mystrosporium Spragueï* B. & C.) On fallen branches. Car. (Curt.). N. Eng. (Sprague).

217. **Mystrosporium rubigo** *B. & C.*, Curt. Cat., p. 128. On *Phytolacca* and grasses. Car. (Curt.).

218. **Stemphylium fuligo** *B. & C.*, Curt. Cat., p. 128. On branches of *Rhus*. Car. (Curt.).

219. **Triposporum elegans** *Corda*. Curt. Cat., p. 128. On rotten stems. Car. (Curt.).

220. **Ceratosporium fuscescens** *Schw.*, Am. Bor. 2996. On epidermis of *Rhus*.

221. **Drepanispora pannosa** *B. & C.*, Grev. iv, 641. Forming a cloth-like stratum on cut surface of stump. Car. (Curt..)

222. **Spondylocladium fumosum** *Lk.* Schw., Am. Bor. 274. On wood.

223. **Helicosporium vegetum** *Lk.* Schw., Am. Bor. 2634. On wood.

223 *a*. **Helicosporium olivaceum** *Peck* (probably a form of the last). New Jersey (Ellis).

223 *b*. **Helicosporium brunneolum** *B. & C.*, in Grevillea, No. 540. On *Helminthosporium*. New Eng. (Sprague).

224. **Helicosporium griseum** *B. & C.*, in Grevillea, No. 541. On fallen limbs. Car. (Curt.).

225. **Helicosporium fuscum** *B. & C.*, in Grevillea, No. 539. Under pine wood. Car. (Curt.).

226. **Helicosporium aureum** *Corda*. On oak. Car. (Curt.).

227. **Helicotrichum pulvinatum** *Lk.* Schw., Am. Bor. 2574. On stems.

228. **Helicoma Berkeleyi** *Curt.* Grevillea iv, 645. (*Helicoma binale* B. & C.) On *Liquidambar* and *Fraxinus*. Car. (Curt. Rav.).

229. **Helicoma Curtisii** *Berk.* Grevillea iv, 646. On *Salix Babylonica* and poplar. Car. (Curt.); N. Y. (Peck).

230. **Cladotrichum scyphophorum** *Corda*. Pracht. f. 23. On rotten wood. Car. (Curt.).

231. **Cladotrichum uniseptatum** *Cooke*, in Grevillea. On branches. N. Y. (Gerard).

232. **Polythrincium trifolii** *Kze.*, Schw., Am. Bor. 2611. On clover leaves. Car. (Curt.). N. E. (Sprague); Canada (Maclagan).

233. **Cladosporium herbarum** *Lk.* Schw., Am. Bor. 2588. On decayed stems, etc. Car. (Curt.); Ohio (Lea).

234. **Cladosporium effusum** *B. & C.*, Grev. iv, 648. On *Polygonum, Lobelia*, etc. Car. (Curt.). Penns. (Mich.).

235. **Cladosporium compactum** *B. & C.*, Grev. iv, 649. On leaves of *Arundinaria*. Car. (Curt.).

236. **Cladosporium stenosporum** *B. & C.*, Grev. iv, 650. On apple leaves, etc. Car. (Curt.).

237. **Cladosporium microspermum** *B. & C.*, Grev. iv, 631. On leaves of *Quercus obtusiloba*. Car. (Curt.).

238. **Cladosporium cubisporum** *B. & C.*, Grev. iv, 632. On *Ribes*. N. E. (Frost); Maine (Rev. J. E. Blake).

239. **Cladosporium personatum** *B. & C.*, Grev. iv, 647. On leaves of *Arachis hypogaea*. Car. (Rav.).

240. **Cladosporium episphaeria** *Schw.*, Am. Bor. 2607. On old *Sphaeriae*.

241. **Cladosporium simplex** *Schw.*, Am. Bor. 2606. On ash leaves.

242. **Cladosporium virgultorum** *Schw.*, Am. Bor. 2605. On branches and twigs.

243. **Cladosporium iridicola** *Schw.*, Am. Bor. 2604. On leaves of *Iris virginica*.

244. **Cladosporium typhae** *Schw.*, Am. Bor. 2603. On leaves of *Typha*.

245. **Cladosporium sparsum** *Schw.*, Am. Bor. 2602. On scapes of onion.

246. **Cladosporium lignatile** *Schw.*, Am. Bor. 2601. On putrid wood.

247. **Cladosporium bignoniae** *Schw.*, Am. Bor. 2600. On legumes of *Bignonia*, etc.

248. **Cladosporium maculans** *Schw.*, Am. Bor. 2599. On *Jasminum*.

249. **Cladosporium graminum** *Lk. Schw.*, Am. Bor. 2596. On grasses.

250. **Cladosporium epiphyllum** *Lk. Schw.*, Am. Bor. 2597. On leaves. N. Y. (Peck).

251. **Cladosporium grumosum** *Lk.* Schw., Am. Bor. 2596. On *Pteris aquilina*.

252. **Cladosporium fuscatum** *Lk.* Schw., Am. Bor. 2595. On stems.

253. **Cladosporium tenerrimum** *Lk.* Schw., Am. Bor. 2594. On bark.

[*Cladosporium fumago* Lk. Schw., Am. Bor. 2593. Consists of species of *Antennaria*, *Capnodium*, etc.]

254. **Cladosporium fuscum** *Lk.* Schw., Am. Bor. 2592. On stems.

255. **Cladosporium polysporum** *Lk.* Schw., Am. Bor. 2591. On willow branches.

256. **Cladosporium atrum** *Lk.* Schw., Am. Bor. 2590. On stems and cabbage stalks.

257. **Cladosporium solutum** *Lk.* Schw., Am. Bor. 2589. On stems of *Euphorbia*.

258. **Scolicotrichum virescens** *Lk.* Schw., Am. Bor. 2578. On branches.

259. **Scolicotrichum candidum** *Lk.* Schw., Am. Bor. 2579. On fallen leaves.

260. **Myxotrichum chartarum** *Lk.* Schw., Am. Bor. 2581. On paper.

261. **Myxotrichum simile** *B. & C.*, Grev. 691. On decaying *Arundinaria*. Car. (Curt.).

262. **Macrosporium punctiforme** *Berk.* Hook, Journ. On dead stems of *Rubus*. Ohio (Lea).

263. **Macrosporium pinguedinis** *Berk.* Curt. Cat., p. 128. On dead stems. Car. (Curt.); Ohio (Lea).

264. **Macrosporium chartarum** *Peck.* 25th Report, p. 93. On pasteboard. N. Y. (Peck).

265. **Macrosporium brassicae** *Berk.* (Doubtless only *Macrosporium cheiranthi* Fr.). On cabbage leaves. N. Y. (Peck).

266. **Macrosporium Cheiranthi** *Fr.* Grev. iv, 1075. On various leaves, etc. Car. (Curt.; Rav.); Ala. (Beaum.); N. Y. (Sartwell).

var. CIRCINANS B. & C. (*Macrosporium circinans* Curt.). On cabbage leaves. Car. (Curt.).

var. ECHINELLUM B. & C. (*Macrosporium echinellum* Curt.). On leaves of *Platanus*. Car. (Rav.).

267. **Macrosporium antennaeforme** *B. & C.*, Grev. iv, 642. On leaves of *Celtis*. Ala. (Peters).

268. **Macrosporium stilbosporoideum** *B. & C.*, Grev. iv, 643. On leaves of *Crataegus*. Ala. (Beaumont).

269. **Streptothrix atra** *B. & C.*, Grev. iv, 654. On Juniper, etc. Ala. (Peters); Mass. (Sprague); Penns. (Mich.); Car. (Curt.); N. Y. (Gerard).

270. **Streptothrix abietina** *Peck* (is not a *Streptothrix*). On spruce. N. Y. (Peck).

271. **Colletosporium atrum** *Lk.* Schw., Am. Bor. 2558. On trunks of *Smilax.*

272. **Colletosporium umbrinum** *Lk.* Schw., Am. Bor. 2557. On rotten bark.

273. **Arthrinium caricicola** *Lk.* Schw., Am. Bor. 2612. On *Caricos.*

274. **Sporophlaeum graminum** *Lk.* Schw., Am. Bor. 2615. On leaves of *Zizania.*

275. **Gonatosporium puccinioides** *Lk.* (Schw., Am. Bor. 2614.) On leaves of *Carex.*

276. **Conoplea hispidula** *Lk.* Schw., Am. Bor. 2616. On *Panicum.*

277. **Camptoum curvatum** *Lk.* Schw., Am. Bor. 2613. On *Scirpus lacustris.*

278. **Sporodum atropurpureum** *B. & C.*, Grev. iv, 653. On roots of *Arundinaria.* Car. (Curt.).

279. **Chloridium candidissimum** *Schw.*, Am. Bor. 2587. On putrid wood.

280. **Chloridium griseum** *Lk.* Schw., Am. Bor. 2586. On putrid bark.

281. **Chloridium viride** *Lk.* Schw., Am. Bor. 2585. On rotten wood.

282. **Acladium densissimum** *Schw.*, Am. Bor. 2584. On trunks and chips.

283. **Acladium microspermum** *Lk.* Schw., Am. Bor. 2583. On rotten branches.

284. **Acladium conspersum** *Lk.* Schw., Am. Bor. 2582. On trunks.

It is uncertain what the following may be which are referred by Schweinitz to species of *Dematium:*

285. **Dematium cinnamomeum** *Schw.*, Am. Bor. 2787.

286. **Dematium lanatum** *Lk.* Schw., Am. Bor. 2786. Interior of trunks.

287. **Dematium corium** *P.* Schw., Am. Bor. 2785. In fissures of trunks. Penns. (Schw.); Car. (Curt.)

288. **Dematium aeruginosum** *P.* Schw., Am. Bor. 2784. Penns. (Schw.); Car. (Curt.).

289. **Dematium papyraceum** *Lk.* Schw., Am. Bor. 2783. On rotten wood. Car. (Schw.).

290. **Dematium episphericum** *Schw.*, Am. Bor. 2782. On old *Sphoeria.*

291. **Dematium smilacis** *Schw.*, Am. Bor. 2781. On *Smilax.* Car. (Schw.).

292. **Dematium ramosum** *Schw.*, Am. Bor. 2780. On branches of *Andromeda.*

293. **Dematium lentaceum** *Schw.*, Am. Bor. 2779. On trunks.

294. **Dematium aluta** *Lk.* Schw., Am. Bor. 2778. Interior of trunks.

295. **Dematium strigosum** *Lk.* Schw., Am. Bor. 2777. On rotten walnut wood.

296. **Dematium subcosticale** *Lk.* Schw., Am. Bor. 2776. On bark.
297. **Dematium cornutum** *Lk.* Schw., Am. Bor. 2775. On willow branches.
298. **Dematium muscorum** *Lk.* Schw., Am. Bor. 2774. On mosses. N. E. (Murray).
299. **Dematium rupincola** *Lk.* Schw., Am. Bor. 2773. On lichens.
300. **Dematium rupestre** *Lk.* Schw., Am. Bor. 2772.
301. **Dematium jubatum** *Lk.* Schw., Am. Bor. 2771.
302. **Dematium badium** *Lk.* Schw., Am. Bor. 2770. On branches.
303. **Dematium mollissimum** *Lk.* Schw., Am. Bor. 2769. On roots.
304. **Dematium nigrum** *Lk.* Schw., Am. Bor. 2768. On bark.

It is probable that very few, if any, of the last twenty species are autonomous fungi.

March 2, 1877.

The President in the chair. Twenty-one members present.

The following were elected Corresponding Members:

W. L. Distant, London, England.

C. H. Fernald, Orono, Maine.

Mr. Grote drew attention to a paper by J. Boll, of Dallas, Texas, on the fecundation of the species of Yucca, in which it was denied, from fresh facts observed by the author, that the little moth, discovered by Dr. Engelman and described by Mr. Riley and Prof. Zeller, is, essential to the fertilization of these plants. Mr. Boll witnessed the act of oviposition which took place from the outside of the seed-capsule. After the insertion of the egg the moth climbed upon the anthers and with its maxillary palpi collected the pollen, and with the assistance of the tongue rolled it into a mass with which it proceeded to stop up the hole in the capsule at the bottom of which the egg had been laid. Mr. Boll observed that capsules which had not been visited by the moth produced perfect seed, and explains the fact that the Yucca does not seed in Europe by the change in its environment and not by the absence of the moth. Mr. Boll also found that in many cases the pollen was discharged upon the stigma before the flower had opened and the moth enabled to enter. The moth must be considered to intend to use the pollen, not upon the stigma where it would be of service to the plant, but merely to fix the egg more securely in its position in the capsule, the pollen swelling on contact with the sap and closing the hole made by the oviposition of the moth completely. Mr. Boll concludes that in this case as in others the fertilization is only accidentally furthered by the moth, and that the generic name *Pronuba*, proposed for the moth by Mr. Riley, is a misnomer.

Mr. Henry Howland read the following paper: "Recent Archæological Discoveries in the American Bottom."

On motion of Mr. Grote the paper was referred to the Publication Committee.

XV. Recent Archæological Discoveries in the American Bottom

BY HENRY R. HOWLAND.

[*Read before this Society, March* 2, 1877.]

A LITTLE below the city of Alton, in Illinois, and nearly opposite the point where the Missouri debouches into the Mississippi, the bluffs, which once formed the eastern bank of the river, gradually recede from it, following, however, its general direction at an average distance of seven or eight miles, till, in the vicinity of Chester, some eighty or ninety miles further south, they again approach its margin. Between these bluffs and the Mississippi lies a stretch of rich bottom land, intersected by numerous small streams, which occasionally widen into lakes. Its wondrous fertility was such as early to tempt the pioneers of the West to settlement, and in its southerly portion the French planted several flourishing villages, sleepy vestiges of which still remain, while to the northward a migratory party from Virginia and Kentucky established themselves, and gave to their domain the name by which it is now generally known, the "Great American Bottom."

Long, however, before these sturdy tillers of the soil laid claim to their broad acres, another and a ruder folk held right of dominion there. They had long since vanished from the soil, and even tradition was dumb concerning them, but their age-enduring monuments still remain to testify to the busy industry that reared them; and the notable character of these works, as well as their number, certify to us that on this rich alluvial of the American Bottom must have been established one of their greatest seats of empire. In this remarkable system of mounds there seem to have been three principal groups, one of which lay near the river border and within the limits of the present city of East St Louis; another and lesser group on the banks of Long Lake, some twelve miles northward; and the third, which is one of the most extraordinary groups in this country, lies between Indian Lake and Cahokia Creek, some

six miles from the Mississippi and about eight miles in a northeasterly direction from East St. Louis. In this group stands the great "Cahokia Mound," the central point of the system, and the monarch of our prehistoric monuments, towering in its magnificent dimensions pre-eminent over all the remarkable structures left us by the Mound Builders.

Lines of mounds at irregular intervals serve to connect these groups; and scattered over the entire extent of these rich lowlands are mounds standing alone, or in groups of two or three, while occasionally one may be seen surmounting the bluffs, and upon their very verge, two hundred feet above the bottom land. It has been stated that there are two hundred in the series, but from personal observation I am inclined to think that this falls far short of a correct estimate, and that a survey would show that a much larger number may still plainly be traced, for it must be remembered that many of the lesser tumuli have been so altered by the plow that they are not now discernible.

From one of these mounds in the American Bottom it has been my good fortune to secure relics of so remarkable a character, as testifying to the advancement of this ancient people in certain of the arts, that I deem this a fit occasion for placing their discovery on record, and submitting them to your consideration. Before proceeding with their description, permit me to refer to a very interesting paper by Dr. R. J. Farquharson, published during the past year in the proceedings of the Davenport Academy of Natural Science, the substance of which had been presented to the American Association for the Advancement of Science at the Detroit meeting in 1875. This paper called public attention to the discovery in certain mounds near Davenport of a number of Copper Axes, more or less covered with cloth, and its author dwells at length upon the "almost unique character and great archæological value" of these specimens, citing various authorities to sustain the high estimate of importance his society justly places upon them. We have reason for congratulation that, in the discovery and preservation of the curious remains I have to show you, we are able to add the extremely valuable testimony these relics afford of the skill attained by the Mound Builders in the arts of weaving, and of working copper. There is abundant evidence that the copper veins of Lake Superior were well known to this early people, and were mined by them for their supply of this valuable metal; to them, however, it was merely a malleable stone, sufficiently tractable under their rude

hammers to be formed into knives, awls and spear-heads, which were prized as being more durable than their ordinary implements of stone. It has been stated that a few copper implements found in Wisconsin show marks of having been cast in a mould, but there does not seem to be sufficient evidence to establish this beyond a doubt. As this metal was obtained only with great difficulty, these implements were very scarce, and are of extremely rare occurrence in the mounds. The copper axes found at Davenport are believed to have been rather badges of authority than implements of utility, and the few other articles of copper which have been found, with the exception of an occasional chisel or awl, seem to belong to a class of ornaments of very rude construction. Heretofore no copper relics have been described which evince any considerable degree of skill in their making. Prior to the destruction of the St. Louis "Big Mound," in 1870, no articles of copper had been found in the vicinity; in leveling that mound two "spoon-shaped" copper implements were discovered, and in the possession of Dr. J. J. R. Patrick, of Belleville, Ill., is a nugget of native copper, which was found in a large mound at East St. Louis. The mound from which the articles now under consideration were taken was one of that second group of the American Bottom system to which I have alluded. Some twelve miles north of East St. Louis, a sluggish creek or slough with high banks, called Long Lake, joins Cahokia Creek, and on its banks, near the point of juncture, stands a group of some thirteen or fourteen mounds, circled around a square temple mound of moderate height. At the western border of this group, and close to Mitchell Station, stood originally three conical mounds of considerable size, which were first cut into some years since in laying the tracks of the Chicago and Alton Railroad. On the twentieth of January, 1876, acting upon a chance intimation in a St. Louis morning paper, I visited this group, and found that the largest of these three mounds was being removed to furnish material for building a road dike across Long Lake, replacing an old bridge. The work was already far advanced, but in its progress some singular discoveries had been made. The mound was originally about twenty-seven feet high, and measured one hundred and twenty feet in diameter at the base, but the various assaults which from time to time had been made upon it for similar purposes had materially altered its proportions, the surface workings having reduced its height some ten feet, though I could not learn that in these early openings anything of especial interest had been discovered.

During the present excavations, however, the workmen found, at a height of four or five feet above the base of the mound, a deposit of human bones from six to eight feet in width, and averaging some eight inches in thickness, which stretched across the mound from east to west as though the remains had been gathered together and buried in a trench. On this level, scattered about within an area of six or eight feet square, and perhaps twenty feet from the southeasterly side of the mound, were discovered a number of valuable relics, together with a large quantity of matting in which many of them had been enveloped. The archæological zeal of the Celtic mind was, however, not adequate to the preservation of this matting, and, unfortunately, most of it, together with the bones, had been carted off and re-interred in the ditch. I was able to secure several small fragments, which show a coarse, vegetable cane-like fibre, simply woven without twisting, the flat strands measuring about one-eighth of an inch in width.

Among the many curious articles carefully wrapped in these mattings, and here buried, were found a number of small Tortoise Shells formed of copper, which, being unique, are worthy of special attention. Of these I obtained three specimens, the rest having been scattered.

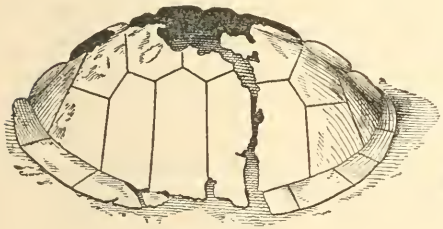


Fig. 1.

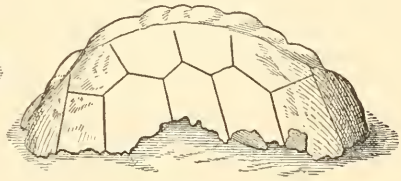


Fig. 2.

They are made of beaten copper scarcely more than one sixty-fourth of an inch in thickness, the larger and more perfect one measuring two and one-eighth inches in length and 13-16 inch in height. Their shape is remarkably true and perfect, showing a central ridge from end to end, produced by pressure from the under surface. (See figures 1 and 2, also the two central photographs, Plate VI.) A narrow flange or rim, about 5-32 inch in width, is neatly turned at the base, and over the entire outer surface the curious markings peculiar to the tortoise shell are carefully produced by indentation—the entire workmanship evincing a delicate skill, of which we have never before found traces in any

discovered remains of the arts of the Mound Builders. Each of these tortoise shells would seem to have originally been covered with several wrappings of a very singular character, and one still adheres to its original envelope, presenting a peculiar mummified appearance. This somewhat remarkable peculiarity is common to many of the other relics here found, and each of the successive coatings with which they are covered has been submitted to microscopic examination by Dr. George J. Engelmann, of St. Louis, with results as shown by the engravings on Plate VIII. Closely fitting over the outer surface of the copper shell is, first, a woven cloth of a vegetable fibre, similar in its general character to the outer matting above described, but of a stronger and better preserved fibre, apparently more like that which forms the woven coating of the Davenport axes.* This is covered in turn with a softer, finer fabric, now of a dark-brown color, formed of twisted strands, laid or matted closely together, though apparently not woven. The material of which these strands are formed proves, under microscopic examination, to be animal hair, as shown in fig. 3, Plate VIII. This fact is of singular interest, as it is believed that this is the only instance in which any such fabric has been discovered in connection with relics of the Mound Builders. A careful examination would seem to show the material to be rabbit's hair, in a perfect state of preservation, though none but short hairs are found and most of these are without either tip or base, though occasionally, as shown in the plate, the tips are found, as also the parts towards the base of the hairs, showing several rows of cells. For the purpose of comparison in establishing their identity, the hair of the common rabbit as it appears under the microscope, is shown in the first three cuts, Plate VIII; fig. 1*b*, showing that part near the tip; fig. 1*a*, that near the root of a large hair, and 1*c*, a section near the root of a smaller hair; fig. 2, Plate VIII is a section from near the root of a deer's hair; the *tips* of these deer's hairs, however, bear a much greater resemblance to those of the rabbit as exhibited in the cuts. Especially noticeable is the extreme nicety with which these fine strands are laid together to form a close-fitting coat.

Overlying this singular fabric and adhering quite closely to it is a dark colored layer, which under the microscope (fig. 4, Plate VIII) is shown to consist of a membraneous substance with numer-

*Prof. Asa Gray, on a hurried examination of this matting, expresses the opinion that it is made of a bark fibre (not bast), possibly from the fibrous bark of Thuja.

ous pores and distinct cellular structure (nuclei not visible), and would seem unquestionably to be an animal cuticle, a conclusion which is confirmed by the opinion of the eminent botanist Sir Joseph Hooker, who has examined the specimen figured in the plate. The pores are apparently gland openings, and the dark line shows a rent in the cuticle.

This layer seems also very carefully and smoothly shaped, and is covered in turn with a final coating of small dark iridescent scales which probably owe their color to carbonization, as they show in the spectroscope traces of carbon. They appear, however, on microscopic examination (fig. 5, Plate VIII) to be the remains of a layer of non-striated muscular fibre with connecting tissue, possibly from the intestines or bladder of some animal, this having originally served as an outer wrapping for these carefully treasured objects.

Next in point of interest are two specimens (also believed to be unique in their character) of the lower jaw of the deer (Plate VII), in both of which the forward part or that containing the teeth is encased in a thin covering of copper, which extends over the teeth, and over this copper sheathing are the same mummy-like wrappings which I have already described, though in one specimen the coarse vegetable fibre-cloth is lacking, and the case is primarily formed of the fine, soft, matted fabric of animal hair (fig. 3, Plate VIII), which in the others forms the second coating. In both, these wrappings are skillfully made to form a close-fitting and symmetrical case. They measure about two and a half inches from the end of the teeth to the point where the bone is cut off, and the copper sheathing reaches to within half an inch of this, while a hole is bored from side to side through the back of each jaw, as though the articles had been worn suspended from the neck for totems or as badges of authority.

Three curious implements which were found were in the shape of two flat circular discs (upper figure, Plate VI), of uniform size, about 2 3-16 inches in diameter, united by a central shaft, and in general appearance not unlike a narrow spool or thread reel, each having a circular hole through the center ¾ inch in diameter. These were made of bone, and having been polished very smoothly were neatly coated with beaten copper. This is also true of a slender pointed rod of wood 8¾ inches long, which was skillfully covered with a thin copper sheathing extending over its entire length. A number of pieces of very thin wood (of which I secured eight specimens), were also found, which were about 3 inches

long, probably about 2¼ inches across at the widest point and very carefully shaped, being rounded at the base and running to a point at the top where they were perforated for convenience in stringing or fastening them together. The striking peculiarity of these thin plates of wood, as of the other objects just mentioned, is that they show evidence of having once been coated with thin copper, many fragments of which still adhere to their surfaces. It is as difficult to conjecture the use of these articles as of a series of five flat copper rods (Plate VI), measuring 3⅛ inches in length and pointed at one end, placed edge to edge and fastened together with flat bands probably of the same material. This singular article, not unlike a picket fence in miniature, in its day may have served a purpose of adornment as a breast-plate or badge worn by some hero of foretime here buried.

Close at hand were one or two rude weapons of stone. Of one a fragment only was preserved, the other was a double-pointed spear head, a foot long, made of light-colored chert and precisely similar to those made by the North American Indians. With them was found a bundle of eight copper rods or needles from fourteen to eighteen inches in length, all in one bundle, wrapped together with matting. In addition to these, several awls and needles of various sizes made of bone were discovered, and with them a considerable quantity of beads made from the column of Busycon shells; two of those which I obtained measure respectively 2⅛ and 4 inches in length, are slightly curved in shape and perforated from end to end. I would also call your attention to three pear-shaped beads, each 13-16 long, and about the size of an olive, which were originally like the other relics described, wrapped in matting, a fragment of this casing still adhering to one (as shown in Plate VII). Not less curious is a necklace or circlet of twenty flat crescent-shaped ornaments of shell, each some three inches long and pierced at one end for the cord or thong which fastened them together.

A day or two later, in digging on the northwest side of the Mound, the workmen found near its base a mass of bones indicating another trench burial; but the only relics found with these remains were numerous sea shells of the species Busycon Perversum, which must have been brought from the Gulf of Mexico, concerning which it is worthy of note that the crowns or tops of the shells are missing, having apparently been cut off in each instance at abont the same angle, indicating that one part or the other was made to serve some

useful purpose in the economy of this strange people. In one very large specimen which I secured, the whorl or column of the shell had been cut away and the edges smoothly ground, forming a scoop-shaped implement about a foot in length.

These noteworthy remains may but feebly serve us, perchance, in tracing the ethnic relations of the Mound Builders, that riddle concerning the solution of which we are so prone to theorize, but they give us a clearer insight into the degree of their advancement in certain of the mechanical arts than we have yet possessed. The peculiar wrappings in which the objects are encased make us familiar with their woven and matted fabrics of a different character from any which have been heretofore discovered, and in the singular character of the relics themselves and their coatings is vouchsafed us a curious glimpse of what may have been connected with their superstitions, or perchance their customs of social distinction. The sea shells brought nearly one thousand miles from the Gulf of Mexico, and the copper from the mines of Lake Superior, are witnesses to the far-reaching intercourse of this prehistoric folk, while even the civilized races of our day can scarce excel them in the skill (as evidenced by these remains) with which they wrought this valuable metal into articles of utility or ornament.

April 6, 1877.

Mr. Grote in the chair. Thirty persons present.

W. L. Carpenter, U. S. Army, was elected a Corresponding Member.

Vice-President Hayes read a paper entitled: "On the Origin of Life," for which the thanks of the Society were voted.

May 4, 1877.

Henry A. Richmond in the chair. Fourteen members present.

L. G. Thurston of Nashville, Tenn., was elected a Corresponding Member.

Mr. Grote exhibited specimens and remarked that there were two forms, apparently specifically distinct, to which the terms *Agrotis campestris* Grote, and *Agrotis decolor* Morrison, should be respectively applied. He had become aware of this on sending what he supposed was an undescribed species to Mr. Morrison under the number "25," which was returned to him with the determination that it was "a typical specimen of *decolor*." Mr. Morrison's original description was too brief for use, and it is not probable, from his identification of *campestris* with *decolor*, which Mr. Grote had adopted, that he had distinguished the two forms. On comparison *decolor* may be distinguished from *campestris* by the brighter brown thorax, basal and subterminal fields of the primaries; the median space is black; the stigmata smaller, notably the orbicular, and more completely and distinctly outlined; the orbicular more oblique in position; the lines were vividly black; the ovipositor protruded.

Mr. Grote exhibited specimens of *Sperlerpes salmoneus*, as determined by Prof. S. W. Garman, taken in springs on the Canada side near the International Bridge crossing Niagara River. The specimens were adults and larvae. It was remarkable in the darker colored larvae that the branchiae or external gills were present, becoming subsequently absorbed. The specimens were exhibited alive in the aquaria of the society, and the process of shedding the exterior layer of the skin in the adult was described by Mr. Grote. It was rolled backwards, catching against the hind legs where it sometimes remained twenty-four hours before being got rid of. The external gills were believed to be retained during life by the *Necturus* of Lake Erie, merely during the larval state in *Sperlerpes*, while they had not yet been detected in the *Menopoma* of the Alleghany River, the embryology of which was so far unknown.

Referring to the swaying movement of live specimens of the *Menopoma*, referred to in a paper read before the American Association for the Advancement of Science at the Buffalo meeting last year, Mr. Grote now thought that it might be concomitant with the act of breathing.

The following paper was read: "Description of a new species of Argulus by D. S. Kellicott."

XVI. Description of a New Species of Argulus

BY D. S. KELLICOTT.

I FOUND, parasitic on *Lepidosteus osseus*, taken in the Niagara River, at Buffalo, in September, 1876, an Argulus which seems to be undescribed. I present the following description and figures and propose the name:

Argulus Lepidostei.

Carapace obcordate, greatest breadth a little more than one-half the entire length of body; convex, transparent, its lobes barely covering the third pair of swimming legs. Eyes brown, compound, having about sixty areolae. Antennae, first pair two-jointed, second joint terminating in a slender hook, basal joint nearly as broad as long, having a hook on its anterior margin, also another on its posterior (difficult to show in figure); second pair slender, one-third longer than the first pair, five-jointed, first joint bears a hook at its base, second nearly at right angles to the first (articulation with the same obscure), third as long as the first two, also equal in length to the fourth and fifth together, the last articulation being very slender. There are spines at the articulations. Posterior to the antennae on either side of the extremity of the siphon in line with the eyes are two stout brown hooks. Abdomen one-third as long as cephalothorax, as broad as long, deeply notched, lobes acute; on the inner margin near the apex is a slender tubercle with a few hairs; bodies at the base of the lobes (female) large, brown, ellipsoidal. Legs, first pair terminated by suctorial discs, second or ambulatory pair with three strong teeth on the thighs, the outer two rising from the same base, the inner one removed from the outer two one-half its length, more slender, the last joint ends in two hooks; just back of the insertion of the second pair are two pairs of hooks directed backwards; the remaining four pairs, the nalatory legs end each in two long pinulae, the third and fourth pairs having an extra recurved pinula; while the third, fourth and fifth pairs are three-jointed, the sixth is obscurely two-jointed, with an appendage at base, these appendicular lobes slightly curved backwards, obtuse, reaching to the margin of the abdomen, covered with hairs.

Color light yellowish green, upper part of body blotched and streaked with violet brown. Length of female .36 of an inch, greatest width of carapace 1.9 of an inch.

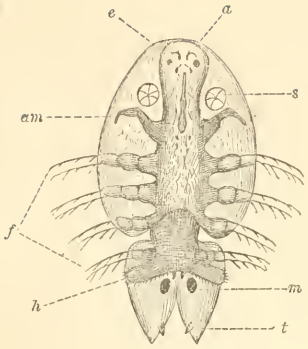


Fig. 1. (♀×3)

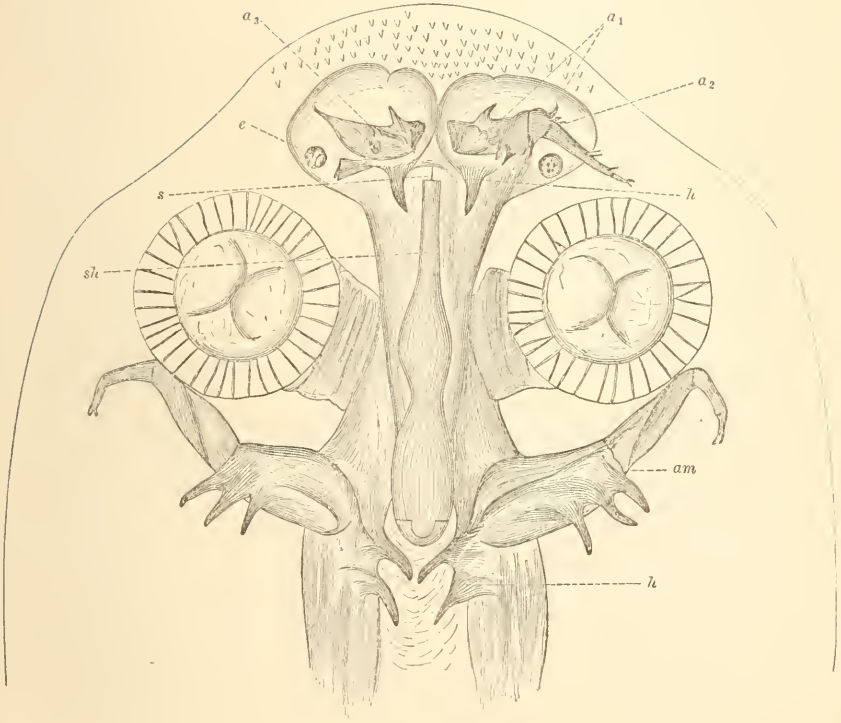


Fig. 2. (×18)

Fig. 1. *a*, antennae; *e*, eyes; *s*, suctorial discs of the first pair; *am*, ambulatory or prehensile pair; *sw*. natory legs; *h*, appendages of last pair; *m*, brown bodies; *t*, tubercles.

Fig. 2. a_1, antenna of first pair; a_2, antenna of second pair; a_3, antenna of first pair, the corresponding one of second pair removed; *e*, eye; *sh*, siphon; *am*, ambulatory legs; *h*, hooks; *s*, spiculum.

Of several individuals obtained all were females.

The favorite place for the parasite to fasten is immediately back of the pectoral fins of its host. It often left the fish and swam about the tank, then returning fastened to any part presented, and crawled to its place near the pectoral fins. I have reason to believe that it may also occupy the gill cavities. I have left individuals alone in a glass of water five days without any apparent loss of vigor.

The blood circulation is very well seen at many points, especially about the eyes and at the margins of the abdominal lobes. The current passes down the inner margin, around the apex and up the outer margin; at intervals along the outer edge lateral currents are given off, which seem to occupy blood vessels proper. The corpuscles are small, apparently spherical and not numerous.

The striped muscular fibers moving the legs and antennae can be very clearly made out with an inch objective.

The species of this genus are indeed microscopical and zoological gems whose value is not enhanced by their rarity.

August 3, 1877.

Vice-President Chandler in the chair. Sixteen persons present.

G. W. Belfrage, of Clifton, Bosque Co., Texas, was elected a Corresponding Member.

The following paper was read: "A new Check List of North American Sphingidæ by A. R. Grote."

Mr. Grote exhibited specimens of *Dictyophyton filitextile* Hall, in connection with a letter from Prof. Lesquereux in regard to them. One of the specimens was intermediate in character between *filitextile* and the *D. Conradi* of Hall, being distinctly costate on one side. The specimens were finer than those from which Prof. Hall's illustrations were made, and evidently prove that there is but one species to be considered.

Mr. Grote exhibited a specimen of *Catocala Frederici* Grote, collected by Mr. Belfrage, in Bosque Co., Texas. The species had been originally described from types in the Berlin Museum in 1868, since when the species had not been seen until now. On comparing the specimen with an excellent water color drawing made by Tieffenbach, under the direction of the late Prof. Hopffer, from the Berlin examples, it is seen to agree perfectly. The species may be quickly known by its pale greenish gray primaries with wavy indistinct shaded transverse lines, and the light yellow hind wings crossed by a narrow black median band, terminating in a hooklet, opposite which, on external margin, is a black dot. The terminal band is short and restricted, the species is a little smaller than the *C. illecta* of Walker. In this connection Mr. Grote exhibited a specimen of *C. Herodias*, of Strecker, belonging to the *coccinata* group, and *C. Verrilliana* of Grote, the smallest red-winged Catocala, both from Mr. Belfrage's collections in Texas.

Mr. Grote referred to the Tenth Annual Report of the Trustees of the Peabody Museum of American Archæology and Ethnology, which was just received, and which contained a Report by Dr. C. C. Abbott, on the rough stone implements found by him in the drift of New Jersey. Dr. Abbott concludes that the deposit examined is glacial

drift and is corroborated by Prof. Shaler, in this important fact. Dr. Abbott concludes that the "similar surface relics may also be glacial in age and were dropped from melting ice-rafts during the retirement and destruction of the southern limit of the ice, and finally that inasmuch as it is probable that this early race was driven southward by the ice, and returned northward, following the shrinking of the glacier, that many of these surface-found implements were made by these same people, when re-occupants of the country." Mr. Grote referred to the similarity of these views with those expressed by him in a note to the American Naturalist, July, 1876, in a lecture entitled "The Early Man of North America," delivered January 6, 1877, and printed in the Buffalo *Courier* of the following day, reprinted in the Popular Science Monthly for March, 1877; and in a paper "On the Peopling of America," read before this Society, February 2, 1877, and reprinted in the American Naturalist for April, 1877. On the receipt of a copy of Mr. Grote's lecture, Dr. Abbott had written him to the effect that it had given him "an admirably clear idea of the whole subject." In the same letter Dr. Abbott wrote: "I have of late been so much occupied with the one point of finding relics in the *moraines* here that I have not given careful attention to the subject in all its bearings." Mr. Grote referred to Dr. Abbott's previous views on the subject of these implements in his papers: "Traces of an American Autochthon," Am. Nat., June, 1876, and "Stone Age in New Jersey," and regretted that Dr. Abbott had not seen fit to mention at least one source of his amended views, at the present time when Mr. Grote's theory of the peopling of America received such important corroboration. As given in the American Naturalist, Mr. Grote's hypothesis with regard to the Peopling of America involved the following propositions:

(1.) That during the Tertiary period man had spread from Equatorial lands on the eastern hemisphere to Northern Asia, and had then crossed into America from the North.

(2.) That in at least as early as Pliocene time man had migrated down the high lands adjacent to the mountainous backbone running along the western side of the two Americas.

(3.) That the Ice period produced a race modification of the man living in the extreme north, and that the advance of the ice prevented further communication between the Old and the New Worlds until comparatively recent times.

(4.) That this race accompanied the great glacier on its advance and retirement over North American territory, and that the existing representatives of this race are the Eskimos.

XVII. New Check List of North American Sphingidae

BY A. R. GROTE.

[*Read before this Society, August* 3, 1877.]

CAUDIBERBES Borkh.[1]

HEMARIS *Dalm.*

1. **thetis** (*Boisd.*) *Grote.* California.
2. **palpalis** *Grote.* California.
3. † **rubens** *Hy. Edw.* California.
4. † **cynoglossum** *Hy. Edw.* California.
5. **tenuis** *Grote.* New York; Ohio; Wisconsin.
   Macroglossa fumosa Strecker.
6. **diffinis** (*Boisd.*) *Grote.* Canada; New York; Massachusetts.
7. **marginalis** *Grote.* Michigan; Ohio; Indiana.
8. **axillaris** (*G. & R.*) *Grote.* Texas.

CHAMAESESIA *Grote.*

9. **gracilis** (*G. & R.*) *Grote.* New York; Massachusetts.

HAEMORRHAGIA *G. & R.*

10. **Buffaloensis** *G. & R.* New York.
11. **uniformis** (*G. & R.*) *Grote.* Anticosti; Canada; New York; Penn.
    Ruficaudis ‡ Walk., Butler, Streck., nec Kirby.
12. **Floridensis** *G. & R.* Florida.
13. **thysbe** (*Fabr.*) *G. & R.* Massachusetts; New York; Pennsylvania.
    Sphinx pelasgus Cramer.
    Sesia eimbiciformis Stephens.
    ? Sesia rufieaudis Kirby.
14. † **fuscicaudis** (*Walk.*) *G. & R.* Georgia.

---

[1] Since the publication of the "Check List" in this Bulletin (vol. 2, 224), the works of Dr. Boisduval and Mr. A. G. Butler have been received. Mr. Hy. Edwards and Mr. H. Strecker have also published certain species. The generic changes in the present List have been explained in a paper sent to the Canadian Entomologist. Species which I have not examined are preceded by a †.

AELLOPOS *Hubn.*

15. **titan** (*Cram.*) *Hubn.* Ohio; New York; Massachusetts; Texas.
    Macroglossum annulosum Swains.
    Macroglossa balteata Kirtl.
16. **tantalus** (*Linn.*) *Hubn.* Texas.
    Sphinx zonata Drury.

EUPROSERPINUS *G. & R.*

17. **phaeton** *G. & R.* California.
    Macroglossa Erato Boisd.

ARCTONOTUS *Boisd.*

18. **lucidus** *Boisd.* California.

LEPISESIA *Grote.*

19. **flavofasciata** (*Barnst.*) *Grote.* Canada.

PROSERPINUS *Hubn.*

20. **clarkiae** (*Boisd.*) *Clem.* California.
    Lepisesia Victoria Grote.
21. **gaurae** (*Abb. & Sm.*) *Clem.* Georgia.
    ? Pterogon juanita Streck.

AMPHION *Hubn.*

22. **nessus** (*Cram.*) *Hubn.* New York; Canada; Mass.; Penn.

THYREUS *Swains.*

23. **abbotii** *Swains.* Massachusetts; New York; Pennsylvania.

ENYO *Hubn.*

24. **lugubris** (*Linn.*) *Walk.* Georgia; Alabama; Texas.

DEIDAMIA *Clem.*

25. **inscripta** (*Harr.*) *Clem.* Massachusetts; New York; Pennsylvania.

EUMORPHAE *Hubn.*

HYLES *Hubn.*

26. **chamaenerii** (*Harr.*) *Grote.* Canada; Massachusetts; Pennsylvania.
    Sphinx epilobii Harr.
    Deilephila galii ‡ Walk.
    Deilephila canadensis Guen.
    ? Deilephila intermedia Kirby.
    ? Deilephila oxybaphi Clem.

DEILEPHILA *Ochs.*

27. **lineata** (*Fabr.*) *Harr.* Canada; California; Mass.; Georgia; Texas.
Sphinx daucus Cram.

DUPO *Hubn.*

28. **vitis** (*Linn.*) *Grote.* Massachusetts; Pennsylvania; Southern States.
Sphinx fasciatus Sulzer.
Dupo jussieuae Hubn.

29. **linnei** (*G. & R.*) *Grote.* Alabama.
Sphinx vitis ‡ Cram (268 *E*).

PHILAMPELUS *Harr.*

30. **pandorus** (*Hubn.*) *Walk.* Massachusetts; New York; Pennsylvania.
Phil. satellitia ‡ Harr.
Phil. ampelophaga Boisd.

31. **achemon** (*Drury*) *Harr.* Mass.; New York; Penn.; Southern States.
Sphinx Crantor Cram.

ARGEUS *Hubn.*

32. **labruscae** (*Linn.*) *Hubn.* New Jersey; Missouri.

PACHYLIA *Walk.*

33. **ficus** (*Linn.*) *Walk.* Key West, Florida.
Ch. crameri Mén.

34. †**lyncea** *Clem.* Texas.

METOPSILUS *Dunc.*

35. **tersa** (*Linn.*) *Dunc.* Canada to Texas.

ELIBIA *Walk.*

36. **versicolor** (*Harr.*) *Butl.* Massachusetts; New York; Ohio.

EVERYX *Boisd.*[1]

37. **choerilus** (*Cram.*) *Walk.* Mass.; Kansas; New York; Southern States.
Sphinx Azaleae Abb. & Sm.

38. **myron** (*Cram.*) *Walk.* Canada; New York; Mass.; Southern States.
Sphinx pampinatrix Abb. & Sm.

var. **cnotus** (*Hubn.*). Southern States.

[1] *Otus* of Hubner is preoccupied in ornithology. In August, 1865, I proposed to restrict *Darapsa* of Walker to *rhodocera*.

PHALAENOIDES *Borkh.*

CALASYMBOLUS *Grote.*[1]

39. **astylus** (*Drury*) *Grote.* Massachusetts; New York; Pennsylvania.
Sphinx Io Boisd.
Smerinthus integerrima Harr.

40. **myops** (*Ab. & Sm.*) *Grote.* New York; Mass.; Southern States.
Smerinthus rosaeacarum Boisd.

PAONIAS *Hubn.*

41. **excaecatus** (*Ab. & Sm.*) *Hubn.* Canada to Southern States.
Paonias pavoninus Geyer.

SMERINTHUS *Latr.*

42. **ophthalmicus** *Boisd.* California.
var. **pallidulus** *Hy. Edw.* California.

EUSMERINTHUS *Grote.*[2]

43. **geminatus** (*Say*) *Grote.* Canada; Mass.; New York; Pennsylvania.
44. **cerisii** (*Kirby*) *Grote.* Hudson Bay Territory.

TRIPTOGON *Bremer.*

45. **modesta** (*Harr.*) *Butler.* Canada; Massachusetts; New York.
Smerinthus princeps Walk.

var. **occidentalis** *Hy. Edw.* California.

CRESSONIA *G. & R.*

46. **juglandis** (*Abb. & Sm.*) *G. & R.* Canada to Southern States.
♀ *Smerinthus pallens* Strecker (pallidior).

var. † **robinsonii** *Butl.* (major).

---

[1] I include *myops*, which has the margin of secondaries entire and agrees better with *astylus* in others respects. I am of the opinion that Butler is wrong in referring *jamaicensis* of Drury to *myops;* as Prof. Lintner has pointed out, it agrees better with *geminatus*. Paonias is characterized by both wings being more regularly scolloped, approaching *Cressonia* and *Laothoe*.

[2] This genus differs in the shape of primaries and secondaries from *Smerinthus*. The branches on primaries are shorter, and the median vein runs close to the subcostal for a third of its length. It includes *coecus* and *kindermanni*.

MANDUCAE *Hubn.*

CERATOMIA *Harr.*

47. **amyntor** (*Hubn.*) *G. & R.* Canada; Mass.; Penn.; Mich.
Ceratomia quadricornis Harr.

DAREMMA *Walk.*

48. **undulosa** *Walk.* Connecticut; Massachusetts; New York; Penn.
Sphinx brontes ‡ Boisd.
Ceratomia repentinus Clem.

49. **hageni** *Grote.* Texas.

DILUDIA *G. & R.*

50. **jasminearum** (*Boisd.*) *G. & R.* New York; Pennsylvania.
51. † **leucophaeata** (*Clem.*). Texas.
52. † **catalpae** (*Boisd.*). Georgia.

AMPHONYX *Poey.*

52. **antaeus** (*Drury*) *Poey.* Key West, Florida.

PHLEGETHONTIUS *Hubn.*[1]

53. **rustica** (*Fabr.*) *Grote.* Pennsylvania; Virginia; Southern States.
54. **carolina** (*Linn.*) *Hubn.* Massachusetts to Cuba.
55. **quinquemaculata** (*Haw.*) *Grote.* Canada to Middle States.
Phlegethontius Celeus Hubn.
56. **cingulata** (*Fabr.*) *Grote.* New York to Cuba.

SPHINX *Linn.*

57. **drupiferarum** *Abb. & Sm.* Canada to Southern States.
58. **kalmiae** *Abb. & Sm.* Canada to Southern States.
59. **chersis** (*Hubn.*) *G. & R.* Canada to Pennsylvania.
Sphinx cinerea Harr.
60. † **perelegans** *Hy. Edw.* California.
61. † **oreodaphne** *Hy. Edw.* California.
62. † **vancouverensis** *Hy. Edw.* California.
63. **gordius** *Cram.* Canada; New York; Pennsylvania.

---

[1] I referred the European *P. convolvuli*, as generically distinct from *Sphinx ligustri*, to *Macrosila*.—Ann. N. Y. Lyc., Oct., 1866. I was unaware then that *Protoparce* was described the "year previously," as Mr. Butler says, and so had adopted Walker's term *Macrosila* for the present genus, the type of which may be taken as *Carolina*. But Hubner's term is older than ither.

64. **luscitiosa** *Clem.* Massachusetts; New York; Wisconsin.
65. **lugens** *Walk.* Missouri; Arizona; Texas.
Sphinx eremitoides Strecker.
66. † **canadensis** *Boisd.* Canada.
? Sph. plota Strecker.

LINTNERIA *Butl.*

67. **eremitus** (*Hubn.*) *Butl.* Massachusetts; New York; Wisconsin.
Sphinx poecilia Steph.
Sphinx sordida Harr.

DOLBA *Walk.*

68. **hylaeus** (*Drury*) *Walk.* Mass.; Missouri; Ohio; Southern States.

DILOPHONOTA *Burm.*

69. **ello** (*Linn.*) *Burm.* New York; Pennsylvania; Southern States.
70. **merianae** *Grote.* Texas.
71. **obscura** (*Fabr.*) *G. & R.* Pennsylvania; South Carolina.

HYLOICUS *Hubn.*

72. **plebeius** (*Fabr.*) *Grote.* Massachusetts; New York; Pennsylvania.
73. †**sequoiae** (*Boisd.*). California.
74. † **strobi** (*Boisd.*). California?
75. † **cupressi** (*Boisd.*) *Butl.* Georgia.

ELLEMA *Clem.*[1]

76. **coniferarum** (*Abb. & Sm.*). Maryland; Southern States.
77. **bombycoides** *Walk.* Canada; Massachusetts; New York.
Ellema Harrisii Clem.
78. **pineum** *Lintn.* New York.

---

[1] The generic name *Lapara* of Walker is too near the previous *Lipara*, I think, to be retained.

INDEX TO PLATES.

I.

Eusarcus scorpionis.

II.

1. Apatela persuasa.
2. Apatela paupercula.
3. Tarache lactipennis.
4. Hadena Putina.
5. Tricopis aleucis.
6. Oncocnemis occata.
7. Agrotis rudens.
8. Homohadena induta.
9. Homohadena incomitata.
10. Bolina ochreipennis.

III.

1. Agrotis opaca.
2. Agrotis sculptiiis.
3. Agrotis muraenula.
4. Agrotis scandens.
5. Oncocnemis Augustus.
6. Agrotis feniscea.
7. Agrotis Bostoniensis.
8. Agrotis (Ammoconia) aratrix.
9. Agrotis (Ammoconia) chortalis.
10. Agrotis introferens.

IV.

1. Agrotis Alaskae.
2. Agrotis gravis.
3. Agrotis vapularis.
4. Agrotis Milleri.
5. Agrotis costata.
6. Agrotis cinereicollis.
7. Apatela spinea.
8. Agrotis exsertistigma vel Morrisonistigma.
9. Agrotis discoidalis.
10. Aputela lupini.
11. Agrotis facula.
12. Agrotis variata.
13. Hadena olorina.
14. Agrotis laetula.
15. Hadena culculliformis.

V.

1. Catocala Angusi ♂.
2. Catocala Angusi ♀.
3. Catocala insolabilis.
4. Catocala residua.

Plate VI.

Upper figure: Perforated disc or reel coated with thin copper.

Middle figures: Two tortoise shells of thin beaten copper.

Lower figure: Breast-plate or ornament of pointed flat copper rods banded together.

Plate VII.

Two views of deer's jaw, coated with copper, and covered with a casing of woven and matted fabrics.

Pear-shaped beads, one showing fragments of original coating still adhering.

Plate VIII.

Figure 1*a*, section of rabbit's hair taken near the root.

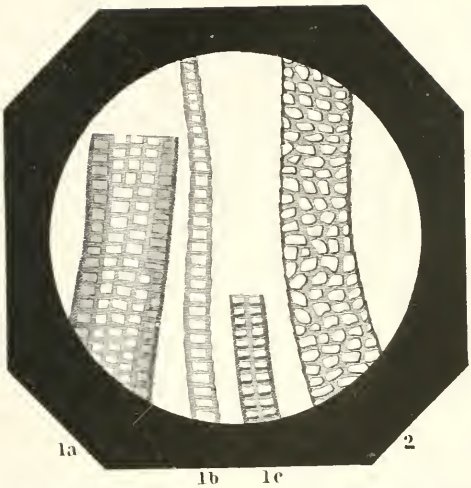
Figures 1*b* and 1*c*, section of rabbit's hair taken near the tips.

Figure 2, section of deer's hair taken near the root.

Figure 3, section of animal hair forming the strands of soft fabric covering copper articles from mound.

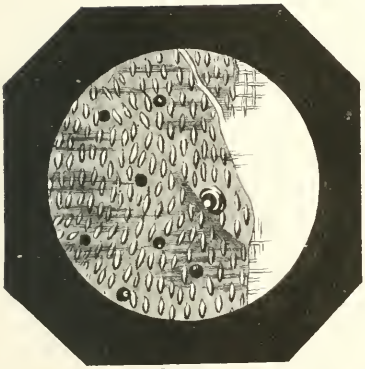
Figure 4, layer of animal cuticle from same objects.

Figure 5, small scales of muscular fibre, forming the final coating of some objects.

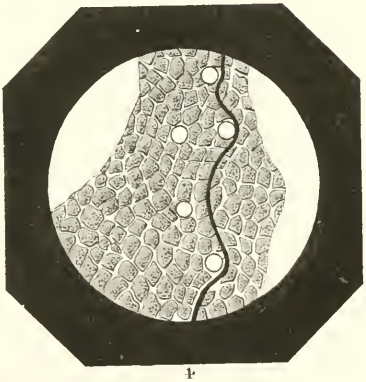


1a 2

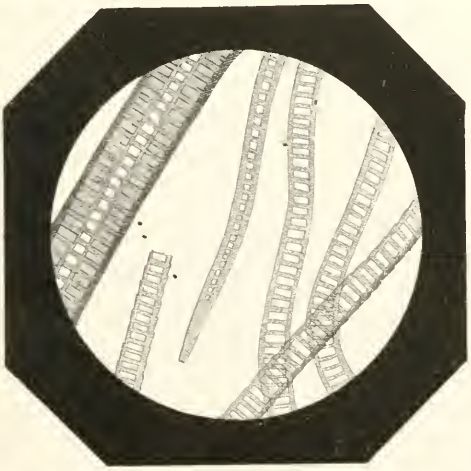
1b 1c



5



4



3

E. Hanisch

GENERAL INDEX.

Page.

Acerra muricina 85
Agrotis aeneipennis 81
Alaskae 84
albipennis 80
aratrix 74
Bostoniensis 74
brunneigera 80
campestris 212
chortalis 74
cinereicollis 79
costata 80
decolor 212
discoidalis 82
emarginata 82
exertistigma 79
facula 82
feniseca 74
gravis 81
inconcinna 5
insularis 82
introferens 74
laetula 83
Milleri 78
muraenula 73
nigrovittata 77
opaca 72
orbis 83
scandens 73
sculptilis 73
strigilis 81
vapularis 81
variata 83
varix 83
Apatela spinea 78
Arctophila flagrans 69

Page.

Argulus lepidostei 214
Bolina nigrescens 12
Bombycia improvisa 78
Brachyopa notata 68
racua 67
Brephidium isophthalma 123
Buthotrephis Lesquereuxi 88
Callipsyche Behrii 107
Calycopis cecrops 108
Catocala angusi 188
Frederici 217
insolabilis 187
residua 187
Verrilliana 12
Chalceria cuprea 125
Charadra dispulsa 4
Choephora blanda 86
Cisthene tenuifascia 4
Cleophana eulepis 84
Colpoma juniperum 36
Copelandia eriarcha 137
Criorrhina armillata 68
Dermatia cinamomea 24
tabacina 24
Dictyophyton filitextile 217
Didea laxa 36
Epidemia epixanthe 128
Erimyzon oblongus 95, 157
Eurymene rosaria 131
Eupsyche m-album 112
Eusarcus grandis 17
scorpionis 1, 75
Eusmerinthus geminatus 223
Gaeides dione 126
Hadena olorina 84
patina 7

	Page.
Habrodais grunus	113
Heliophila subpunctata	8
Helvella gracilis	21
Homohadena incomitata	6
induta	6
Homoptera atritincta	14
benesignata	14
edusina	14
Hypaurotis chrysalus	113
Hysterium chlorinum	34
clavisporum	34
depressum	34
gerardi	33
hyalinum	33
thuiarum	33
truncatum	33
Hysterium variable	33
verticolum	33
Leptotes murina	124
Litocala sexignata	3
Lophodermium exaridum	36
Mamestra alboguttata	85
comis	85
nevadae	85
Menopoma alleghaniense	213
Metaponia perflava	11
Mixtemyia ephippium	70
Oncocnemis Augustus	73
Chandleri	87
occata	87
Orthosia posticata	8
Patellaria atrofusca	26
fenestrata	26
Patellaria fusispora	26
stygia	26
Peziza fuscidula	23
Phaedrotes sagittigera	116
Philotes sonorensis	116
Phlegethontius carolina	224
Pippona bimatris	10
Plagiomimicus pityochromus	76
Pleonectyptera immaculalis	13
Polenta Tepperi	75
Propolis rufa	27
Prothymia subolivacea	11
Pterygotus Cummingsi	17
Remigia iudentata	12
Satyrium fuliginosum	106
Scaeva obliqua	63
Schinia media	76
Sperlerpes salmoneus	213
Stictis glaucoma	28
Tarache lactipennis	10
Telesilla navia	10
Temnostoma excentrica	65
Tharsalea virginiensis	125
Tornos robiginosus	15
Trama arrosa	13
Tribilidium hiascens	32
insculptum	32
Tympanis punctoidea	30
Xanthogramma felix	67
Xenisma stellifera	142
Xylota curvipes	70
ejuncida	64
vecors	69

P
Sci
B

46330

Buffalo Society of Natural Sciences.
Bulletin 3, 1875-77.

DATE.

NAME OF BORROWER.

University of Toronto
Library

DO NOT
REMOVE
THE
CARD
FROM
THIS
POCKET

STORAGE

Acme Library Card Pocket
Under Pat "Ref. Index File"
Made by LIBRARY BUREAU